KDevelop User Manual

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Abstract

KDevelop is an Integrated Development Environment to be used for a wide variety of programming tasks.

Chapter 1

What This Manual Contains

This user manual is intended to describe the contents and use of the KDevelop 3.3.91 Integrated Development Environment (IDE) from a user's point of view. It is not a programming manual, nor does it describe the development process in detail. Its only aim is to guide you in the handling of the IDE.

Here you will find information on the following topics:

Getting Started with KDevelop — a Guided Tour Gives you a quick start on the use of this IDE, introducing the basic steps of how to work on a project.

Overview of the Features of KDevelop Extends the guided tour in the previous chapter, giving an overall view of what is built-in within KDevelop and gets you acquainted with the look and feel of this IDE.

Configuring KDevelop Shows how you can tailor the IDE to suit your needs.

Getting started: the Application Wizard Describes the basics of how to set up a new project in KDevelop using the built-in Application Wizard.

Editing tools All you need to write your source files: using the editor, searching for text both locally and project-wide, up to integrating new files and classes into the project.

The File Browsers Demonstrates various tools to look at the structure of your project and how to access the files you want to work with.

The Class Browsers Describes one of the most powerful tools of KDevelop which lets you navigate through class dependencies and allows you to easily create and access the classes and methods you need.

Documentation Shows how to access the rich built-in documentation KDevelop provides and tells you how to create documentation of your project, concise and powerful API documentation providing you an overall view of all your project sources as well as docbook-based user documentation.

Building and Project Management Deals with the creation and management of your project; describing the basics of autoconf and automake as well as how to set up custom make files and how to use compiler or make options to tailor your application to suit your needs.

Advanced Build Management Looks at ways to keep multiple build configurations, to cross-compile for diverse platforms, or to make an embedded system using the Qt/embedded library.

The Debugger Interface Describes how to use the integrated gdb debugger interface so you can hunt down bugs without leaving KDevelop.

Using CVS Tells you how you can maintain your project using the CVS versioning system; a must, especially if many developers work on the same project.

Some commonly used information has been put into the *appendix*. Amongst others this consists of:

Installing KDevelop Tells you where to obtain KDevelop and how to get it up and running.

In a Nutshell — Tips and Tricks A quick reference to commonly used commands and actions. And a short guide to solve common problems when working with KDevelop.

Development on UNIX A historical overview of UNIX® program development, the main tools necessary and why you need an IDE.

Configuration Files Used by KDevelop Lists the files KDevelop uses to save its internal information. This is particularly useful in case something went wrong with your setup.

Plugin Tools Lists the pluggable tools you can use to taylor the capabilities of KDevelop to your needs.

KDevelop User Interface Mode Examples Shows user interface modes.

Further Information Getting Information, reporting Bugs etc.

Changelog Shows the history of this documentation.

Bibliography Bibliography

Chapter 2

Getting Started with KDevelop — a Guided Tour

Bernd Pol Now that you have got your new KDevelop IDE, how are you going to make good use of it? As this is a complex application, the learning curve may be somewhat steep, especially if you are not already used to this type of an Integrated Development Environment.

We will try to soften this learning curve a bit by stepping through the makings of a simple KDE C++ application. Thereby we will have a (cursory) look at:

A first look — the user interface elements of the KDevelop IDE.
Doing some initial configuration.
How to create a new project.
Some tips about dealing with documents.
How to compile the application in this project.
How to add classes and other detail to your project.
What to do to debug the application.
Some basic tools to build program or user documentation.
Last but not least, keyboard shortcuts

Before we start, one important concept should be made clear.

What to expect? As said, KDevelop is an *Integrated Development Environment*. That means in essence that KDevelop is no development tool by itself but rather a graphical front end to easily access a wide range of development tools, many of which actually would require complex keyboard commands run from a text console.

While KDevelop eases many of those programming tasks, much of the complexity from this bundle of tools still remains which means that in order to fully understand the KDevelop IDE you will still need to comprehend these tools actually running beneath the surface.

Hence, we cannot teach you how to build software, but rather introduce you to some of the ways KDevelop was designed to ease such a software building process. If you want to learn more about what an Integrated Development Environment is meant for, you might want to have a look at the Development on UNIX historical overview and there especially at the Integrating Concepts and Tools chapter.

NOTE
The following discussions apply to the default case, where KDevelop starts up in the Simplified IDEAl Window Mode. If you already did switch to another user interface mode some items may not be there as described or will behave slightly different. If in doubt which user interface mode your KDevelop currently uses, check with the Settings → Configure KDevelop... → User Interface dialog.

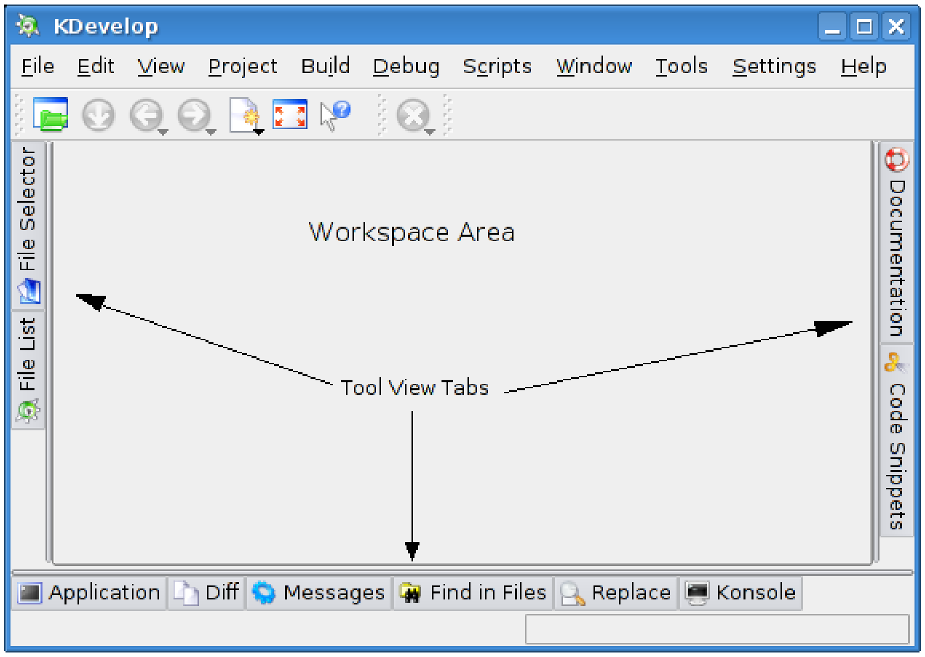
2.1 A Very First Look at KDevelop

This is all about what you will see when you first started KDevelop. You will find preliminary information about:

What is there on the surface?
How to get some help.
What is in the menus?
What are those tool views for?

2.1.1 On the Surface

When you start KDevelop for the first time you will get a display similar to this one:



The KDevelop initial layout(Actually the initial KDevelop window will be larger, but the elements you see are the same.)

Workspace Area and Tool View Tabs In this initial case KDevelop uses the so-called IDEAl user interface mode. A workspace area of maximum possible size is surrounded left, bottom, and right by a series of buttons which act similar to tabs on a tabbed display. If you click on one of those tabs, a so-called *tool view window* will open which allows you to work on a specific task.

Menu and Toolbars On top there is the usual menubar, followed by several rows of toolbars, some being initially empty. They will get populated once there is a project open for actual work.

Status Bar Finally, there is a status bar on the bottom of the window where short informations on several tasks will be shown.

2.1.2 How to Get Some Help

Besides the Help menu which offers answers to specific questions, the status bar and two kinds of tool tips provide some quick information.

What Does This Menu Entry Do? When you place the mouse cursor on a menu entry, there will usually some short information be displayed in the status bar. While in most cases this repeats just the name of the selection, in some cases it will provide additional information about the purpose of the menu command.

What Is the Name of This Item? On many items a short function name tool tip will pop up when you place the cursor on it for a few seconds. This is useful for quick orientation on toolbar or tool view tabs in IDEAl mode when the IDE has been set up to display icons only on these buttons.

What Does This Item Do? More information is available through expanded tool tip help for many items on the IDE. Select Help → What's This? or press **Shift**-F1, then with the question mark cursor select the item you want to know more of. You can as well open any menu this way and click on a specific menu entry (active as well as greyed disabled ones) to see if more information is available.

2.1.3 What is in the menus?

There are ten menus selectable on the menubar. Most of them get fully populated once a project is open for actual work while others require at least one document be open in an editor window. In short, they will allow the following action types.

NOTE
This is only a preliminary overview. For a detailed menu description see the Command Reference.

File **Usual Actions** This is pretty standard. It allows to create, open, save, print, and close document files as well as quitting the KDevelop application as usual.

Revert All This allows to revert all recent, yet unsaved changes by reloading the file from the disk. This works on any file you edit, not only on those which are part of a project.

Edit This menu is useful only if a document is opened.

Usual Actions It provides the usual undo/redo and cut/copy/paste actions. Furthermore it allows to select text blocks in various ways.

Search and Replace There are two very powerful search facility available, Edit → Find in Files..., and Edit → Find-Select-Replace.... These allow, in addition to the usual search and replace actions limited to the the current document, to conduct global search or search-and-replace actions in one single turn.

Advanced Text Edit There are provisions to reformat the current document and to automatically complete partially typed texts in various ways.

View Like the Edit menu, this menu is useful only if there is an open project. I this case there will be the following actions available (amongst others):

Navigation History Switch back and forth through the documents etc. you visited.

Error Tracking Navigate to the source lines of the errors encountered in the most recent compilation/build process.

Editor Related Actions Some entries in the View menu control the look and view of the editor you use. In case of the Kate Part (Embedded Advanced Text Editor) there will be the following controls available:

- Control the word wrap behavior in the document window.
- Show or hide several border displays in the document windows: line numbers, icons, and, additionally, bookmark marks in the scroll bar.
- Control the display of folded (temporarily hidden) sections in a source text.

Project All work of KDevelop is based on *projects* which basically collect source files, build management files, and other information in one project directory. In this menu you control which project to use, which properties it has, and some other managing actions. In particular:

Open a Project Allows to create new projects, open existing ones, and import projects from other environments.

Project Options Allows to define a whole bunch of different project properties.

Classes Management Add new classes to the project and traverse the inheritance tree of a class.

Distribute Project Helps to build distribution packages of the project.

Build This menu is all about compiling and documenting the project. Thus it is of use only when a project is actually open. In this case it provides the following actions:

Compile, Link, Execute Allows to compile and link the whole project or parts of it as well as run the application from within the IDE.

Prepare Build Operations This actually depends on the make system you use for this project. In the case of automake projects it allows to run `Makefile.cvs` and `configure` on their own. There are also provisions to remove translated files from the project in various stages of intensity.

Install the Application Allows to install the application both in local directories as well as in system directories only accessible to the root user.

API Documentation Build or remove a doxygen-based API documentation of the project as defined in the project options.

Debug Although this menu will be filled once a project is active, it of course is useful only if the actual project has been previously compiled with debugging information (this is basically set up in Project → Project Options..). There are the following actions available in this case:

Usual Debugger Actions The first section in the Debug provides a graphical interface to the GDB GNU symbolic debugger. It allows to start and stop your application in the debugger and step through it in various ways.

Breakpoints KDevelop provides several means to set breakpoints in your application sources. One is through the use of the Toggle Breakpoint menu entry.

Advanced Debugging Other Debug menu entries allow more sophisticated program analysis. Use **Shift**-F1 to get more information about their purpose.

Scripts You can call various scripts from this menu to more easily accomplish tedious actions on the text in the currently selected editor window. The available actions depend on the selected script, however.

Window This is fairly standard. You may select any open document window as well as close one or more documents windows in here. You may even select a set of document windows to be closed in one single turn.

Depending on the editor plugin you use may there be other menu items as well. So will the default Kate editor plugin additionally allow to split the editor window horizontally as well as vertically.

Tools KDevelop is highly customizable. You may select a favorite editor for your documents as well as provide external and plugged-in tools to extend the basic IDE capabilities. The Tools menu reflects most of this setup.

Advanced Editing The upper set of Tools menu entries will be provided by the editor plugin which is in use. You may select your favorite editor via Settings → Configure KDevelop...+Editor. Once an editable document file is selected, the upper part of the Tools menu will provide advanced editing commands specific to the editor part in use.

Web Side Handling In case the active document window contains a HTML page (e.g. displayed from a Documentation selection), the Tools will show additional menu entries which provide various means to handle Web pages.

Other Tools Usually there will be a bunch of other entries according to the currently available tools. Use **Shift**-F1 to get more information about their purposes.

Settings This menu allows you to show and hide menubar, toolbars and statusbar. Also, you can configure shortcuts, toolbars, notifications, the editor and KDevelop's general behavior.

Help Here you can open this KDevelop manual, look up terms in various documentation files, open man pages (the traditional UNIX manual format) and info pages (the GNU manual format). Furthermore you can report bugs here or get some info about your current KDevelop version and its authors.

2.1.4 What are those tool views for?

In the IDEAl user interface mode the workspace will be surrounded by three areas of buttons, so-called *tool view tabs*. They provide access to *tool view windows* which accomplish main tasks during software development. Each of these three tool view areas serves a different main purpose.

- **Left Side** Provides access to navigation and selection tools
- **Bottom** These views display messages produced by various tools.
- **Right Side** Provides access to documentation and source management tools.

The number of tool view tabs shown will change once a project is open for actual work. More tools to work on that project will be available then. The actual number of tool views depends on the Plugin Tools being currently available to KDevelop. You will find more on this topic in the Configuring KDevelop chapter.

Currently, with no project open and the default number of plugin tools loaded, you will find the following tool views. Clicking on a tab will open respectively close its tool view window.

Navigation and Selection **File Selector** Provides a panel to navigate the directory tree and select files for work just like you do in the Konqueror. Clicking a file will open it in an appropriate editor window in the workspace area. A right click in the file selector area will pop up a navigation and file manipulation menu.

File List Lists the currently open files. Clicking on a file will usually select its editor window in the workspace area. Use this to quickly navigate in a large number of open files. Furthermore this view provides a means to organize the open files into different *sessions*. This is particularly useful in very large and complex projects to help the developer concentrate on different tasks. Right clicking a file will pop up a file manipulation menu.

Messages Displays **Application** Displays the output from an application started from within KDevelop.

Diff Used to display patch file contents. Displays the output from the difference viewer tool started from the Tools → Difference Viewer... menu.

Messages Displays messages produced by the build tools called from within KDevelop, usually from the Build menu.

Find in Files Displays the list of items found by the global search operation started from the Edit → Find in Files... menu. Clicking on a line here will automatically open that file at the specified position in an editor window.

Replace Lists the results of the global search-and-replace operation issued from the Edit → Find-Select-Replace... menu. In this view you can decide on every found item whether you really want it be replaced or not.

NOTE

This global search-and-replace facility is actually available only after a project has been loaded into KDevelop. Otherwise the global replace tool in the Edit → Find-Select-Replace... menu will in fact be be disabled.

Konsole Opens a KDE Konsole like terminal emulator window where you can use keyboard commands in a traditional UNIX® command line interface.

Documentation and Source Manipulation **Documentation** KDevelop provides access to a whole bunch of documentation through this tool. You may here access document files, usually online from remote locations, in a structured way. And there are several ways available to directly access valuable information from KDE or Qt™ manuals.

See the Documentation and Configuring the Documentation chapters for more details.

Code Snippets This tool allows you to permanently store selected texts for later use in other editing cycles. It is a very flexible tool, as any text snipped stored here may contain a set of variables which will get their actual values at the time when you insert such a snippet in some other text.

More information on this is available in the Code Snippets and Setting Up the Code Snippets Tool chapters.

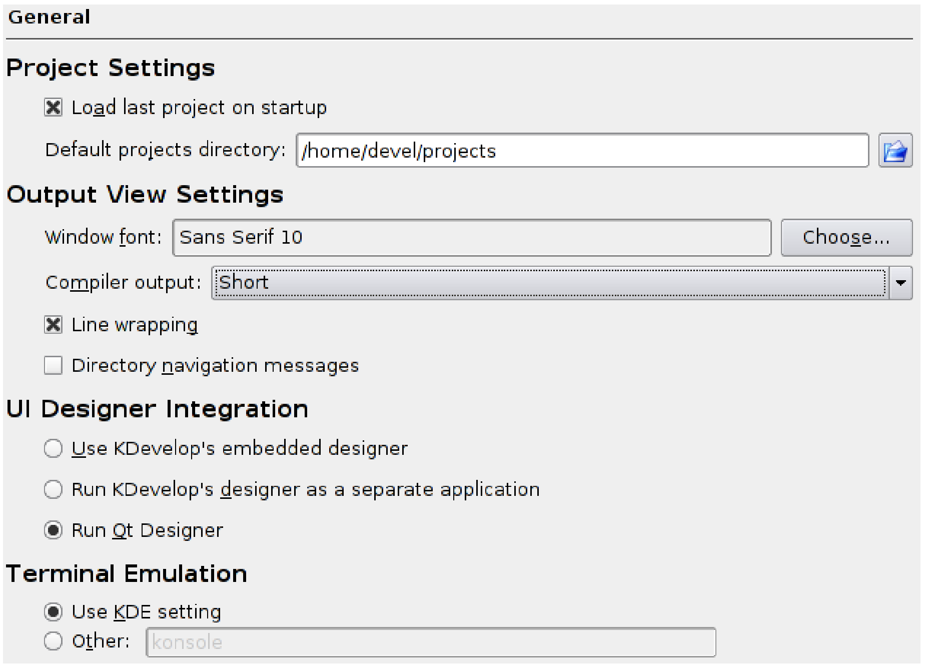
2.2 A Bit of Configuration

Before we actually start a first example project, we should tailor the KDevelop behavior to our needs. Although most of the default settings will be appropriate for now, there are a few places which better should be adjusted.

NOTE
If you want to know more about KDevelop configuration, have a look at the Configuring KDevelop chapter.

2.2.1 Some General Settings

To configure KDevelop, click the Settings menu and select Configure KDevelop.... The Configure KDevelop dialog will pop up, showing the following General settings page to the right.



General

Project Settings

[✓] Load last project on startup

Default projects directory: /home/devel/projects

Output View Settings

Window font: Sans Serif 10 | Choose...

Compiler output: Short

[✓] Line wrapping

[ ] Directory navigation messages

UI Designer Integration

○ Use KDevelop's embedded designer

○ Run KDevelop's designer as a separate application

● Run Qt Designer

Terminal Emulation

● Use KDE setting

○ Other: konsole

The KDevelop general configuration dialog

Most of the defaults will be o.k. But you will probably want to change two of those settings.

Default projects directory At first start of KDevelop this will most likely be preset to your home directory. Most people however prefer a dedicated projects directory for software development. Change the text box to your preferred parent development directory. You may select it from the directory tree if you press the Open file dialog button labeled with a folder icon to the right of it.

In our examples we will assume a (somewhat artificial) user called `devel`. Thus always replace this 'devel' by your user name. Our devel user will utilize the `/home/devel/projects` parent directory for actual development. Again, replace `projects` with your development directory name.

KDevelop will by default set up an own subdirectory below this parent for every new project you create. So will e.g. all files of a project named 'Hello' in our case be located in the `/home/devel/projects/hello` directory.

You may of course temporarily override these directory settings if you need to. See the Application Wizard chapter for more info on this.

Compiler output Whenever KDevelop compiles some source, it will display the messages of the make, etc. build tools in the Messages window in the lower part of the workspace area. Usually these messages will be overwhelmingly wordy. To keep a better overview of what happens, KDevelop has some means of shortening those messages built in.

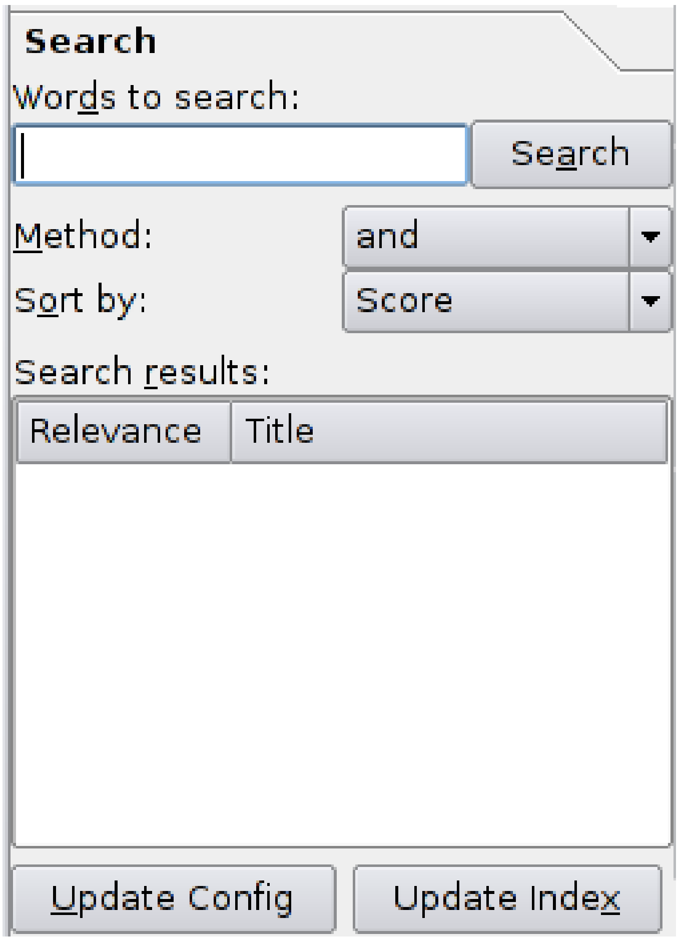
Depending on the KDevelop version you use, the Compiler output selection may be preset to ‘Long’, which will cause all message contents be fully shown. You may probably want to change this to the far more convenient ‘Very Short’ setting. Just select this from the drop down box.

CAUTION
Be aware that only *most basic* information will be shown in the Messages window this way. In case of errors during e.g. a build run you will most likely want to see more, if not all, of the message texts. They are not lost, however. Just right click into the Messages window and select e.g. ‘Full Compiler Output’ from the popup menu.

2.2.2 Initializing Documentation Search Indexes

There is another, not so obvious, item which preferably should be initialized before you start actual development work. This is because you will want to perform documentation search regularly during development. KDevelop requires some search indexes be created before such search operations can be performed. So let’s initialize them before we attempt our first steps toward actual KDevelop work.

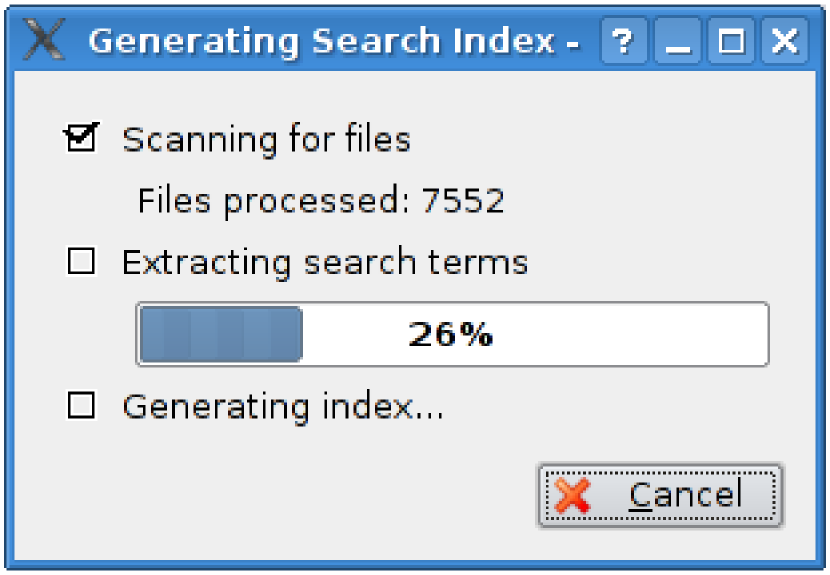
Open the Documentation tool view at the right side of the KDevelop main window. There open the Search dialog page.



Where to generate the search indexes.

Now press the Update Config button to make sure the basic search tools are properly set up. A dialog should pop up, telling ‘Configuration file updated’. Click OK to make it disappear.

This done, KDevelop will be ready to parse the documentation it knows of and build some useful search indexes from it. Press the Update Index button to the right. Now the Generating Search Index dialog will pop up showing the progress of the index build operations.



KDevelop is generating documentation search indexes.

This will take some time depending on the size of documentation and the speed of your machine. But finally the Cancel will make place to OK. Just press this button to proceed.

NOTE

- This usually should work out of the box. In some cases the htdig application KDevelop uses to perform its full text searches might not be properly set up. Refer to the Setting Up Text Search Indexes chapter for more help in this case.
- To be able to look up KDE and Qt^{TM} specific API documentation, it is mandatory that the *KDELibs Apidocs* were present when KDevelop was installed. If you experience problems building the indexes or perform the identifier lookup examples later in this chapter, make sure that this documentation exists and is accessible to KDevelop. See Installing KDevelop fore more detail.

2.3 Starting a New Project

Almost any application will consist of dozens, hundreds, even thousands of files which need kept structured and maintainable. To accomplish this, KDevelop organizes software development tasks in *projects*. Thus the first practical step to develop software in KDevelop usually is to create a new project.

Fortunately this is fairly easily accomplished. KDevelop provides the so-called Application Wizard tool for this. (See the Getting Started — the Application Wizard chapter for more.)

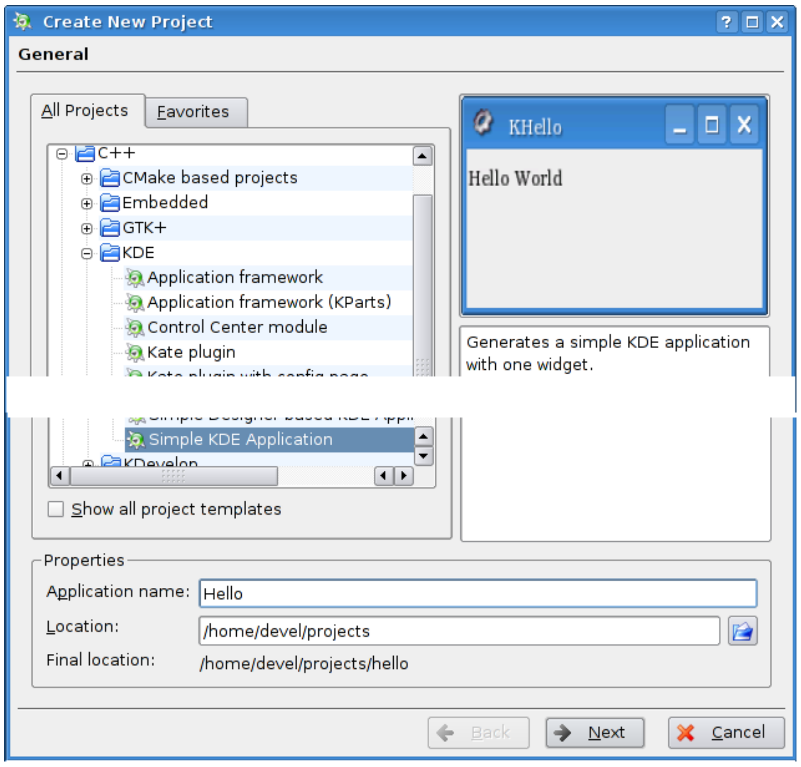
We will now start a simple KDE application project to illustrate how easily this is accomplished and which files and tools KDevelop will have provided. Thereby we will have a short look at:

How to create a new project with the help of the Application Wizard.
Which files the Application Wizard initially did set up.
What about the additional tool view shown with the project?

2.3.1 How to Create a New Project

Let us create a rather simple ‘Hello World’ KDE project. Just follow these steps.

1. To start the Application Wizard click the Project → New Project... menu.
2. The Create New Project dialog will pop up. In the upper left All Projects window there will be a number of programming languages listed.
   (a) We want to build a KDE C++ application as usual, thus click on the + label left of the C++ label to open this branch.
   (b) A series of possible application targets will be displayed. We will build a KDE application, thus open the next sub-branch via the + label next to KDE
   (c) Now you will be offered a series of possible *project templates*. Navigate down to the end of this branch and click Simple KDE Application.A preview and short description of the application this project template will produce pops up in the two windows to the right.



Generates a simple KDE application with one widget.

Properties

Application name: Hello

Location: /home/devel/projects

Final location: /home/devel/projects/hello

Selecting a Hello World project template

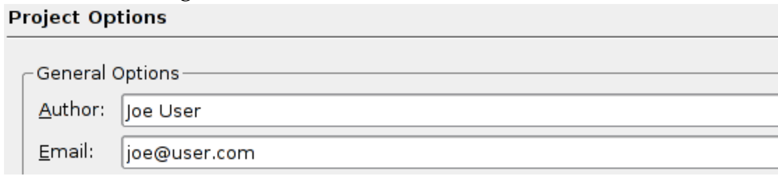
(d) Our application will need a name. Find the Properties area on the dialog bottom and enter a suitable name into the Application name input field.We use 'Hello' in our example, but you can use whatever you like, provided the name consists of letters, number digits, and underlines only. You will find that the Application Wizard rejects any other character.

(e) Make sure the Location text box below the input field shows the name of your top project directory as set up in the A Bit of Configuration chapter above. If it does not do so, enter a suitable directory name or select one from the directory list provided by the folder labeled button to the right.If all went well, the Final location line at the bottom will show the directory path your new project will use. In case there was an '(invalid)' suffix appended, try another name for your project and/or make sure the top project directory in the Location text box really exists and is writable.

(f) Once everything is right, the Next button in the bottom row of the dialog will be enabled. Click it to proceed.

3. This will lead you to the Project Options dialog page. Make sure the Author and Email text boxes are properly filled in. Usually they will default to your general KDE user settings as given in the Password & User Ac-

count dialog of the KDE Control Center. If not, change them to some settings you prefer for your application.


Project Options

General Options

Author: Joe User

Email: joe@user.com

Provide your name and (optionally) email address.

NOTE
You must provide an Author name at least. This is mandatory for the application files setup.

If all is right, the Next button will be enabled. Click it to further proceed.

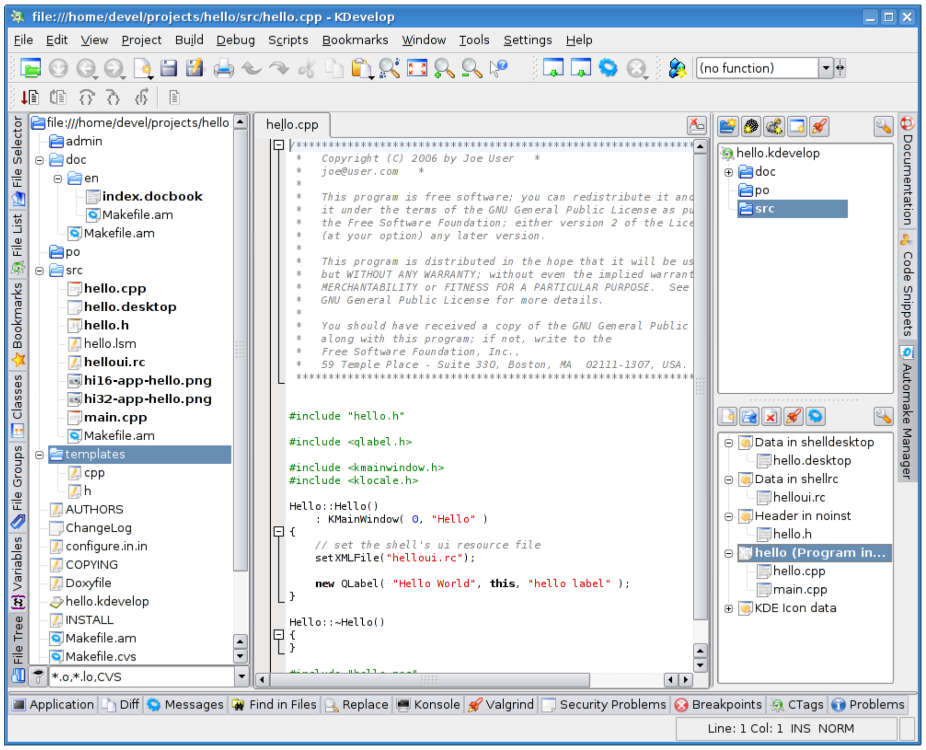
4. The following Version Control System, Template for .h Files, and Template for .cpp Files dialog pages are not of interest for now. Skip them by clicking the Next buttons and, finally, the Finish button.

That was all! The Application Wizard will take over and construct a series of initial files in the Final location directory you provided in step 2c above.

Once this file creation phase is finished, KDevelop will open an editor window for the *application main window* implementation file (which is `hello.cpp` in our example), so you can readily proceed.

2.3.2 Initial Project Files

Even if our sample Hello project is fairly simple, the Application Wizard did create a whole bunch of source and project management files. You will most easily list them if you open the File Tree tool view on the bottom left. This will open a file list similar to the one below.



```
/***************************************************************
 *   Copyright (C) 2006 by Joe User   *
 *   joe@user.com   *
 *
 *   This program is free software; you can redistribute it and
 *   it under the terms of the GNU General Public License as pu
 *   the Free Software Foundation; either version 2 of the Lice
 *   (at your option) any later version.
 *
 *   This program is distributed in the hope that it will be us
 *   but WITHOUT ANY WARRANTY; without even the implied warrant
 *   MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  See
 *   GNU General Public License for more details.
 *
 *   You should have received a copy of the GNU General Public
 *   along with this program; if not, write to the
 *   Free Software Foundation, Inc.,
 *   59 Temple Place - Suite 330, Boston, MA  02111-1307, USA.
 ***************************************************************


#include "hello.h"

#include <qlabel.h>

#include <kmainwindow.h>
#include <klocale.h>

Hello::Hello()
    : KMainWindow( 0, "Hello" )
{
    // set the shell's ui resource file
    setXMLFile("helloui.rc");

    new QLabel( "Hello World", this, "hello label" );
}

Hello::~Hello()
{
}
```

Initial files in our Hello World project

To demonstrate the main bunch of files the Application Wizard produced, we did open most of the directory branches in the left-hand File Tree tool view window. Just click the branch names in the tree to see for yourself.

Additionally, just for demonstration, we did as well open most of the branches the Automake Manager tool view window to the right where some of the project sources are listed, too.

2.3.2.1 Copyright Issues

All GNU conformant applications must be copyrighted. There are two levels which require copyright notices, *individual source files* and *run-time application level*. The Application Wizard did already put appropriate copyright and licensing information into the project files.

Source File Level Copyrights Do you remember the Project Options dialog page in the new project setup? You had to provide your (the developer's) name and optionally an email address there. Now refer to the top of the hello.cpp editor window currently displayed in the workspace area. The Application Wizard did enter these statements on top of the licensing header of every source file it created.

```
/***************************************************************************** ↩

 *   Copyright (C) 2006 by Joe User   *
 *   joe@user.com   *
 *  ↩
                                                                                  ↩
    *
 *   This program is free software; you can redistribute it  ↩
    and/or modify  *
```

You will find exactly the same text headers in every source file you will create inside KDevelop (provided you use the proper built in tools for file creation). KDevelop remembers these settings in some template files you may find in the `templates` directory.

Application Run-Time Copyrights Once your KDE application runs, the user may display some About data, usually from the Help menu. The Application Wizard did also take care of this. If you have a look at the `main.cpp` file, you will find an entry similar to the one below.

```
int main(int argc, char **argv)
{
    KAboutData about("hello", I18N_NOOP("Hello"), version,  ↩
        description,
         KAboutData::License_GPL, "(C) 2006 Joe User", 0, 0,
                    "joe@user.com");
    about.addAuthor( "Joe User", 0, "joe@user.com" );
```

This will put the main developer's name ('Joe User' in our case) and email address into the About copyright page in the display and list this name and address on the Authors page there as well.

IMPORTANT
Whenever you make substantial changes to an existing project, be sure to enter your name and email address to the copyright notices on every file you changed and to the run-time copyright display as well. Don't be shy, you help the open source society considerably if you do so.

2.3.2.2 Initial Source Files

The Application Wizard did put the source files into the `src` sub-directory of the project's directory. You will find the `main.cpp`, `hello.h`, and `hello.cpp` files there as you may have possibly expected.

There are some additional files you usually will find in a typical KDE application, namely

- `hello.desktop` contains some meta data used by KDevelop to maintain and start the application.
- `hi16-app-hello.png`, and `hi32-app-hello.png` contain some initial default icons, KDevelop will use for application display.
- Finally, `helloui.rc` contains a description of the application's user interface, currently the menus the application will provide.

2.3.2.3 Initial Application Documentation

In the `doc/en` subdirectory of the project you will find the `index.docbook` file. This is a default template from where you can start to write a suitable user documentation.

2.3.2.4 Project and Auxiliary Files

You will have noted that the files we introduced so far are listed in boldface in the File Tree tool view while most of the other files are not. This depicts the substantially different tasks these files are used for. The contents of those bold listed files directly influence the application. Source files will produce the code to be run, others will provide necessary data or documentation. These files must be maintained and orderly processed in the build stages by the project, hence they are called *project files*.

If you have a look at the lower Automake Manager window to the right of the workspace area you will find all project files listed as well. The Automake Manager tool uses this knowledge to take care of the build control as we shortly will see.

The other, non-bold listed files are of more auxiliary nature. They belong to several distinctive classes as follows:

- **Project Build Control** These files control the compile, install, documentation building, etc. processes. If the project utilizes the GNU autotools machinery as our example does, you will find a `Makefile.am` file in each project directory. These are kind of basic make core files which contain build control commands and will be processed in conjunction with various `configure` files during the build stages. Such a build produces a final `Makefile` in every directory. And from these in turn the make utility will finally build the binaries of the application.

  Those `Makefile.am` files need to be maintained throughout the development process. Luckily, KDevelop relieves you of most of this burden by the Automake Manager tool, which basically is a graphical front end to maintain `Makefile.am` contents.

  Other project build control files currently listed are `configure.in.in` and `subdirs` in the project root directory. They will be processed by some of the files in the `admin` KDE specific administration directory to produce more `configure` and `Makefile` type files and finally the application's binaries.

- **KDevelop Control Files** KDevelop needs some control and administration data on its own. These are located in the project root directory, in our example `hello.kdevelop`, `hello.kdevelop.pcs`, and `hello.kdevses`.

  Of particular importance in each project is the `xxx.kdevelop` (where 'xxx' denotes the project name) file. It is the main *KDevelop 3 Project File* and needed if you later want load this project into the IDE.

> WARNING
> Never do manually modify, rename, or even delete any of these KDevelop control files! The IDE will most likely not function properly on your project afterwards.

- **GNU Project Description Files** Some files in the project root directory are mandatory in any GNU conformant application. These are: `AUTHORS`, `ChangeLog`, `INSTALL`, `COPYING` (which contains the GNU GENERAL PUBLIC LICENSE), `INSTALL`, `NEWS`, `README`, and `TODO`.
- **Other Files** A few more files, not mentioned yet, are:
  - `Doxyfile` controls the creation of the project specific API internal programming interface documentation.
  - The `templates` directory containes file templates the IDE uses as stubs to create new source files. You may at any time edit these templates. The new contents will be reflected in the next source files you create of the related types.

    You may e.g. want to realign the right hand stars in the copyright lines the Application Wizard inserted into the `cpp` and `h` template files, so the source files created from them will look less awkward.
  - The `po` directory will be used for localization purposes. It is essentially part of the project files (contains a `Makefile.am`) but will mainly be used in translation processing. Not of main interest to the application developer, however.
  - Finally, the `admin` directory is specially needed in KDE oriented applications. It provides a whole bunch of files necessary to maintain the application's sources and binaries so they will integrate properly into the KDE environment.

2.3.3 Additional Tool Views

As you will have noticed, as soon as the Application Wizard had the new project ready, several additional tool views were provided. These make sense during project development only and, in short, provide the following functionality.

> NOTE
> The tool views actually visible depend on the plugins currently loaded into KDevelop. There are ways to control this. See the Plugin Tools chapter for instructions.

2.3.3.1 Navigation and Selection Tools (left side)

- **Bookmarks** You can mark any text file line in order to quickly return to this position from everywhere. KDevelop will remember all those *bookmarks*, even if you close the editor window afterwards. The Bookmarks tool view lists all those bookmarks by file name and line number. You need only click such an entry to open the editor window accordingly and position the cursor on that line.
- **Classes** Lists classes, methods, etc. known in the project. Clicking the entry opens the appropriate header or source file in an editor window and positions the cursor at the respective declaration or definition.
- **File Groups** Sorts the files in the projects into various utility groups, i.e. Sources, User Interface, Icons, Translations, and Others. Clicking an entry opens that file in an editor window.
- **Variables** This is used by the debugger tool to display, evaluate, and watch variables during debug runs.

2.3.3.2 Messages (bottom)

- **Valgrind** Valgrind is a run-time program analyzer. This tool view lists the results of such an analyze run. It is used e.g. to find memory leaks.
- **Security Problems** There is a Security Checker plugin tool for KDevelop. It analyzes the currently edited source file for several common security problems which may occur in the application and notifies the user in this tool view window.
- **Breakpoints** This tool view allows to explicitly set, clear, and manage debug breakpoints in the application source files. It is used in conjunction with the debugger.
- **CTags** Allows to create a database of identifier indexes using the popular CTags application. This tags database may then be used from out this tool view window to look up any needed identifier in the project sources. Clicking a thus found item line will open an editor window and position the cursor on the appropriate identifier there.
- **Problems** KDevelop keeps track of common programming problems in the currently edited source file and notifies the user in this tool view window.

2.3.3.3 Source Management (right side)

- **Automake Manager** The Automake Manager tool is basically a graphical front end to maintain the contents of the `Makefile.am` files located in each project directory. This tool view uses two windows to control its work. The upper window mirrors part of the project subdirectories, namely those which explicitly contain *project files*. Each subdirectory of this kind must contain a `Makefile.am` file and is termed a *subproject* in the Automake Manager context.

Clicking a subproject entry opens a suitable display of the project files in this subproject in the lower window. The files listed there will be grouped according to their `Makefile.am` functionality in this subproject.

The Automake Manager is a very powerful tool to manage the project and its subprojects as well as the roles project files play in building the application. We will have a short look at a few major details below. See the Building and Project Management chapter for a more extensive description.

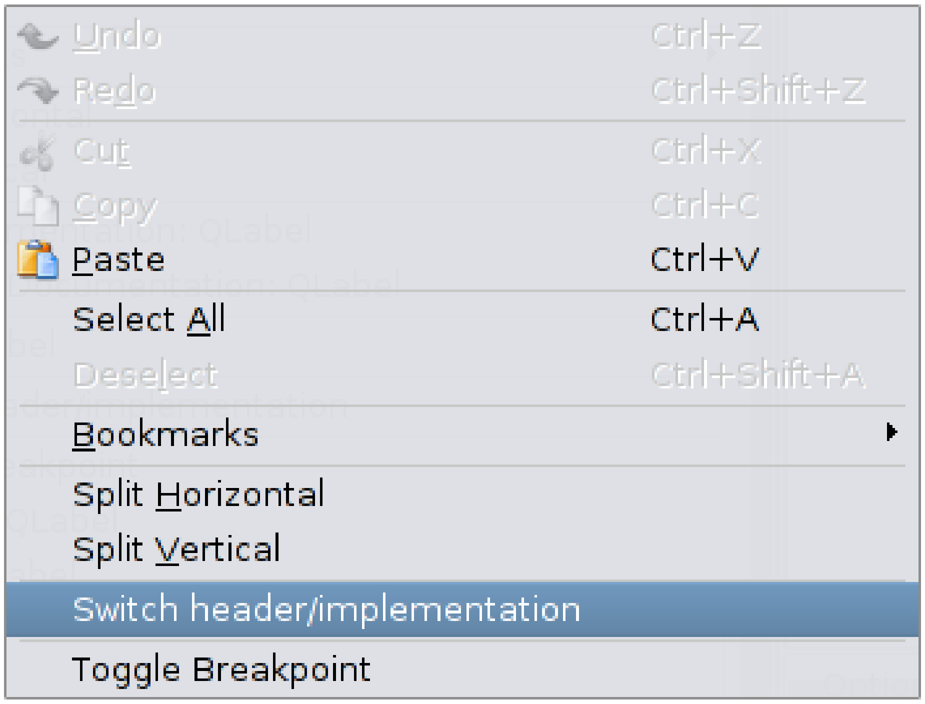
2.4 Some Tips About Dealing With Documents

In our example project the Application Wizard did leave the `hello.cpp` file open in an editor window, so you can immediately start working. Now, we may well assume your are knowledgeable about using an editor, so we do not need talk much about this here. But there are some handy KDevelop specifics about dealing with such tabbed editor windows and the documents you are working on. We will have a short look at some of them, namely:

How to easily switch between header and implementation files.
How to quickly access declarations and definitions.
How to arrange editor windows to your current needs.
How to keep an eye on common problems.

2.4.1 Switching Between Header and Implementation Files

KDevelop provides a quick and easy way to switch from a given implementation (`.cpp`) file to the corresponding header (`.h`) file and vice versa. Just right click into the editor window you want to switch. A menu similar to the following will pop up.



How to switch between implementation and header files.

Find the Switch header/implementation entry and select it. KDevelop will look up the corresponding header or implementation file and open it in another editor window. In our example, if you did right click into the `hello.cpp` source, the `hello.h` file will be displayed and the cursor positioned there.

There is even more. If you do right click inside the text of a class implementation, KDevelop will position the cursor on the corresponding declaration line in the header file. And vice versa, right clicking on a declaration line will bring you to the corresponding class implementation.

If the editor window with the file to be switched to already exists, KDevelop will of course activate this one and reposition the cursor there if necessary.

2.4.2 How to Access Declarations and Definitions

But what if you are working on a source file and want to look up the declaration or definition of an identifier you just found there? Well, this is equally easily accomplished. Basically all you need to do is to right click on the identifier in question.

There are two different cases to consider, however, namely:

Accessing externally defined identifiers, and
dealing with project internal text items.

2.4.2.1 External Declarations and Definitions

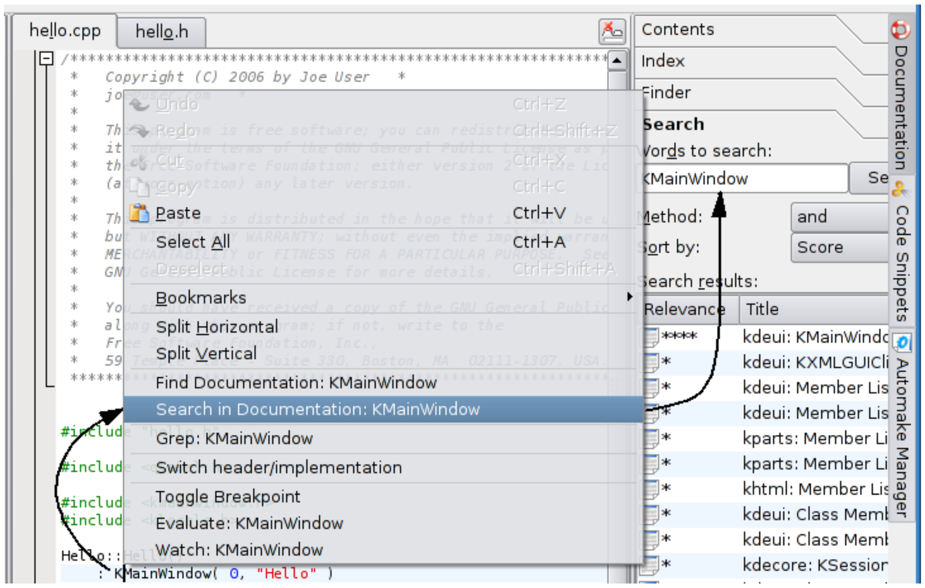
In a most common case you want to look up an identifier which was defined externally to your project. In KDE projects such identifiers are most likely documented in various KDE or Qt™ libraries. If KDE and KDevelop were properly installed, KDevelop will be able to access such so-called API documentation and be able to search it for identifiers of this kind.

Let us look at an example. In the `hello.cpp` editor window find the following lines.

```
Hello::Hello()
    : KMainWindow( 0, "Hello" )
{
```

Right click on `KMainWindow`. A menu will pop up. There select the Search in Documentation: KMainWindow entry and release the mouse button. Now the Documentation tool view will open, showing the `KMainWindow` entry as search item on the Search sub-page. And a short while after another editor window will open in the workspace area, showing the KDE API Reference page of the `KMainWindow` class.

This all will look like the following. (We deliberately opened the Documentation, Search page already to illustrate the result of the menu selection.)



How to look up an externally documented identifier.

You might as well select Find Documentation: KMainWindow. In this case the Finder sub-page of the Documentation tool view will show up, usually providing a selection of pages containing the search term. (In our example this will probably be the `KMainWindow` and `KMainWindowInterface` classes. Select the one you are interested in and the corresponding documentation will be displayed in an editor window.

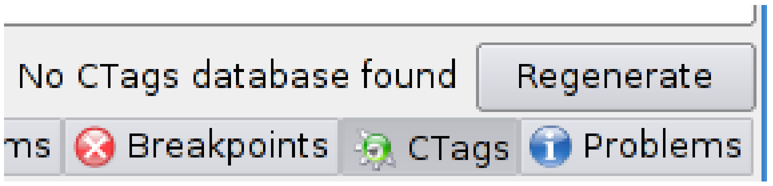
NOTE
If this did not work, then there is probably no documents index yet. Did you initialize the indexes as shown above? If not, please do so, then come back here and try again.

2.4.2.2 Project Internal Declarations and Definitions

Such search facilities in external documentation have their limitations, however. Of course one cannot look up an identifier externally if it is only defined and used inside the current project. But there is help. KDevelop can use indexes built by the CTags application to search the sources in your project.

Before we can use this on our Hello example project, we must however first generate a suitable index. This is done by the CTags tool view at the bottom of the workspace area.

When you click the CTags tab, a dialog window will open where you will find the following key in the lower right corner.



Build a CTags index with the Regenerate key.

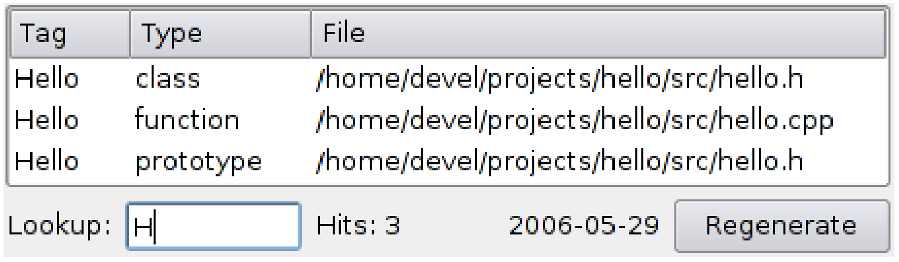
Press the Regenerate button and wait a few seconds. Then the No CTags Database Found will be replaced by the current date. Now you are ready to perform some identifier look ups in your project source.

TIP
The date next to the Regenerate button is there to remind you of possibly too old indexes. Whenever you are obviously not able to look up some identifier in your project, consider regenerating the index. On large projects this might take considerable time, but you should make it a habit to regenerate the index regularly after extensive source file changes.

To look up an identifier in your project sources there are several possibilities.

- **Use the CTags tool view** This is easy. Just start typing the identifier name you are interested in into the Lookup input field in the bottom left. KDevelop will try to complete the word you have typed so far and show all occurrences of those identifiers which start with this character sequence.

If for example you want to know wherever the ‘Hello’ identifier was used in our example project, type an "H" into the Lookup input field. KDevelop will immediately start working and present you a result like this:



Tag	Type	File
Hello	class	/home/devel/projects/hello/src/hello.h
Hello	function	/home/devel/projects/hello/src/hello.cpp
Hello	prototype	/home/devel/projects/hello/src/hello.h

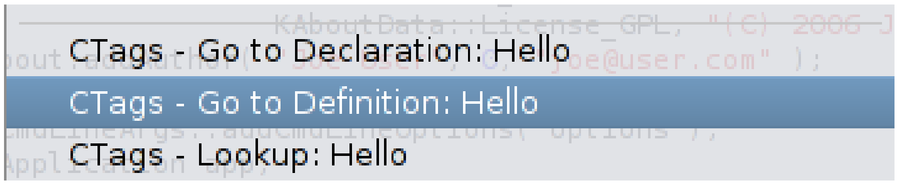
How to look up an identifier in the CTags tool view.

If you click one of the listed entries, KDevelop will open an editor window with this file and position the cursor on the appropriate place.

- **Use a context menu in a source file** This is handy while you are working on a certain source file. Assume you are studying the `main.cpp` file of our Hello example project. There you find the following line

```
    Hello *mainWin = 0;
```

and wonder whatever the ‘Hello’ was used for in the program. To find out, simply right click on this Hello identifier. A menu will pop up in response to this right mouse click, featuring the following lines near the bottom.


CTags - Go to Declaration: Hello
CTags - Go to Definition: Hello
CTags - Lookup: Hello

Getting CTags information on a project internal identifier.

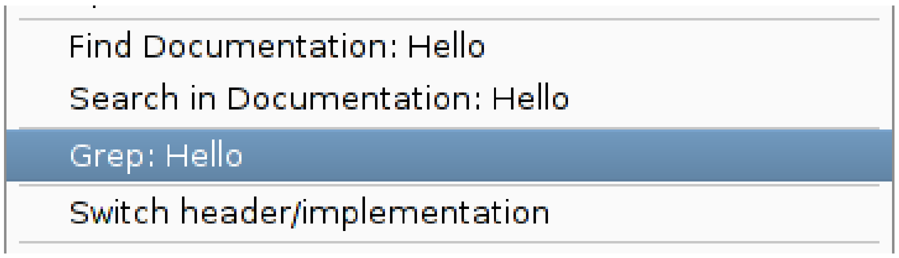
Click what you are interested in, say CTags - Go to Definition: Hello, and KDevelop will immediately open the `hello.cpp` editor window and position the cursor right in front of this class definition:

```
Hello::Hello()
    : KMainWindow( 0, "Hello" )
{
```

- **Do a global search** This is especially useful if you want to look up arbitrary text in your project source. There are two possibilities to start a global search from within KDevelop.
  - Start a global search from the Edit → Find in Files... menu. Or
  - Directly make use of the context menu with a right mouse click in the editor window.

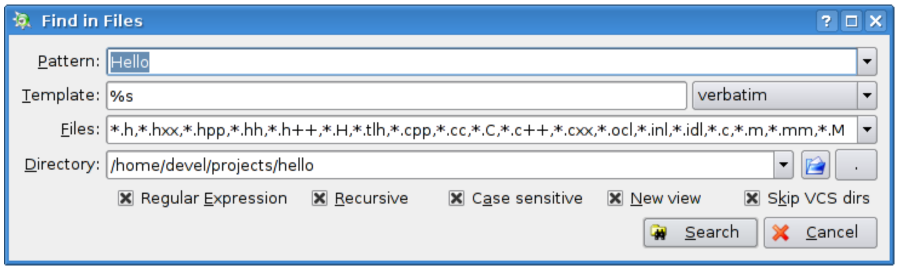
We will illustrate the second possibility on our Hello example project. The outcome of the menu call will essentially be the same. Let us assume you are studying the `hello.cpp` source file and have the cursor positioned on the first Hello occurrence there. Now you wonder, where this one word ‘Hello’ was used in the project source and how many occurrences there are. This is a typical case where to use KDevelop’s global search facilities.

Now, still keeping the cursor somewhere on this ‘Hello’ in the source text, click the right mouse button. The now well known context menu will pop up, where you should select the Grep: Hello line.


Find Documentation: Hello
Search in Documentation: Hello
Grep: Hello
Switch header/implementation

Initiating a global search from within an editor window.

This will pop up the following Find in Files dialog (exactly the same as if you did use the Edit → Find in Files... menu).



Pattern: Hello

Template: %s verbatim

Files: *.h,*.hxx,*.hpp,*.hh,*.h++,*.H,*.tlh,*.cpp,*.cc,*.C,*.c++,*.cxx,*.ocl,*.inl,*.idl,*.c,*.m,*.mm,*.M

Directory: /home/devel/projects/hello

[✓] Regular Expression [✓] Recursive [✓] Case sensitive [✓] New view [✓] Skip VCS dirs

A versatile graphical front end to perform global searches in the project.

As you see, this is a very versatile tool to initiate find-and-grep searches throughout your project. We won’t delve further into details here, but you may want to experiment with this facility on your own. For the moment, there should be our ‘Hello’ be preselected in the Pattern field. If it is not, just type it in, then press the Search button at the bottom right.

Now the Find in Files tool view will open at the bottom, showing you file names and lines of all literal occurrences of ‘Hello’ in our example project. As usual, if you click an entry, KDevelop will get you to exactly that position in an editor window in the workspace area.

There are two lines of special interest in the tool view window.

– Right on top you will find the command sequences KDevelop did actually use to perform the search. This will be useful to more precisely control the search outcome.

– On bottom the number of occurrences found in these search run will be listed. In our example this should read '*** 11 matches found ***'.

KDevelop will remember these search results throughout the currently running session. If you initiate another global search, its results will display in another tabbed window in the Find in Files tool view window.

2.4.3 Arranging Editor Windows

When your work with large complex projects you will often end up with quite a lot of tabbed editor windows residing on the tab bar. This makes specific facilities to clean up, order, and group all those editor tabs necessary. KDevelop provides several means for this. We will have a short look at some of them.

How to remove unneeded tabs.
How to rearrange the tabs.
How to view several files simultaneously in the workspace area.
How to edit C++ source and header files simultaneously
How to group source files into development sessions.

2.4.3.1 Cleaning up the Tabs Row

If the vast amount of editor window tabs becomes badly arranged at all, you usually may want to close all those tabs you really do not need any more. KDevelop provides several facilities to do so, the usual way of bulk closing open editor windows and a more specific approach where you can expressly command which ones to close and which to keep open.

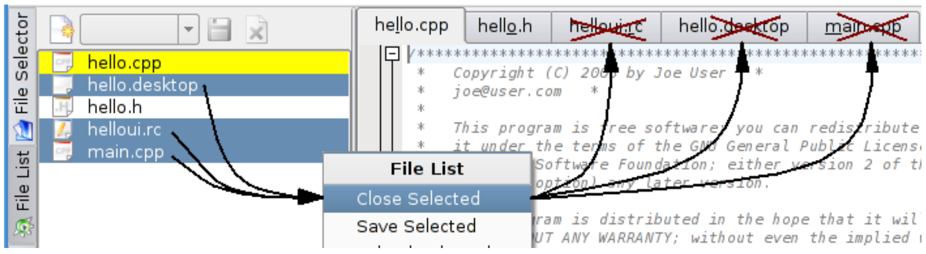
Closing Several Tabs At Once This is kind of a bulk approach to close unnecessarily open tabs which you may find in other KDE applications as well. You can use the Window menu or right click on a tab to either

- close the currently selected editor window,
- close all other open editor windows, or
- close all editor windows at once (available from the Window menu only).

Closing Selected Sets of Tabs The step-by-step approach of closing individual editor window tabs can become awkward if there are a great number of tabs from which you want to still keep several open. Instead of searching and closing one editor window tab after another KDevelop provides a means to select the candidates from a list and close those, and only those, with one single mouse click.

Let us illustrate this on a simple example. In our Hello example project let us assume there were several files open for edit: `hello.cpp`, `hello.h`, `helloui.rc`, `hello.desktop`, and `main.cpp`. Now you want to close all of them except `hello.cpp` and `hello.h`. The easiest way to do so is with the File List tool view. Because this list of open files is alphabetically ordered you can more easily find the ones you want to be closed. Proceed as follows:

1. Open File List and, with the **Ctrl** key held down, click the files you want to be closed in the list.
2. Then, keeping the mouse pointer on a file name in the list, click the right mouse button.
3. From the File List popup menu select Close Selected.



```
/*************************************************************
 *   Copyright (C) 200  by Joe User   *
 *   joe@user.com   *
 *
 *   This program is free software; you can redistribute
 *   it under the terms of the GNU General Public Licens
         Software Foundation; either version 2 of th
         option) any later version.

         ram is distributed in the hope that it wil
         UT ANY WARRANTY; without even the implied
```

How to close selected editor windows in one step.

That was all. KDevelop will have closed all editor windows at your wish, and you are ready to proceed with a clean tab bar again.

2.4.3.2 How to Rearrange Edit Window Tabs

Even if you have only the really necessary editor windows open you may still want to have their tabs arranged in some logical way. KDevelop provides some common means to do so, in short:

Basic Setup — Where to Position New Tabs By default, when you open a new editor window, its tab will be inserted to the right of the editor window tab currently in use. This can be changed so that the new tab will open to the far right on the tab bar.

You must change a basic user interface setting in KDevelop to enable this behavior.

1. Select Settings → Configure KDevelop...
2. In the left hand icon bar on the dialog popup click the User Interface icon. The User Interface dialog page will be now shown.
3. In the left bottom corner there find the section labeled Tabbed Browsing. Remove the check mark on the Open new tab after current tab line.
4. Close KDevelop and restart it again. Now the new editor window tabs will open at the far right end of the current tabs row.

Unfortunately, this setting cannot be changed on the fly during a development session. You must make up your mind which behavior you prefer in the long run and then stick to it, at least until the next start of KDevelop.

How to Rearrange the Tabs As development tasks do vary over time, the need to rearrange the tabbed editor windows will more or less often arise. This is easily accomplished in KDevelop.

Just click the tab you want to move with the middle mouse button and move the mouse a short distance. The cursor will change to a crossed-arrow pattern. You can now drag this tab, holding the middle mouse button down, until it did skip into the place where you want it to be.

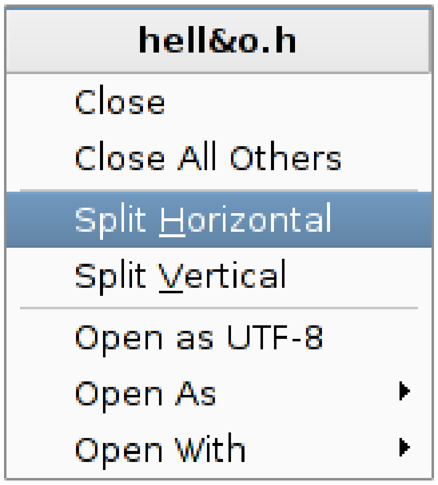
2.4.3.3 Viewing Several Files Simultaneously

At first sight there is always at most one single editor window open to work on a source file. Although you may fast switch the tabbed windows, there are times where you want have several files open at once, e.g. for reference purposes or to keep complex tasks under better control. To accomplish this, KDevelop provides a way to split the workspace area into different, simultaneously visible sections which each can hold their own series of tabbed windows.

There are two split commands which you can reach either through the Window menu or by right clicking either into a tabbed window or on the window tab itself. We will illustrate this splitting behavior again with our Hello example project.

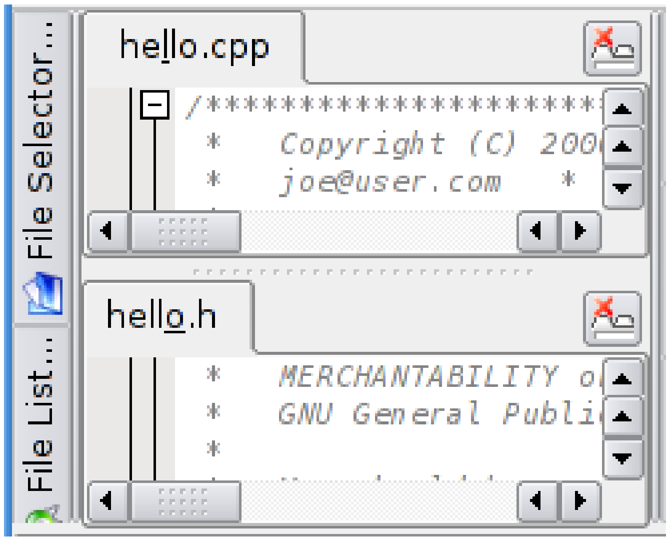
Assume there are two source files open on the tab bar, `hello.cpp` and `hello.h`. Now, while working on the `hello.cpp` source, you often need to refer to the declarations in the `hello.h` headers file, so you want to keep both files open simultaneously.

To get this done, right click on the tab of, say, `hello.h`. The following menu will then pop up.



How to split the current workspace area into two parts.

Select the Split Horizontal entry. This will split the current workspace area in the middle and move the tabbed editor window holding the hello.h file into the lower part.



```
/********************
 *    Copyright (C) 200
 *    joe@user.com    *
```

```
 *    MERCHANTABILITY o
 *    GNU General Publi
 *
```

The workspace has been split horizontally.

Note the dotted separator line between both windows. You can grab it with the mouse and adjust the heights of the editor windows according to your needs.

There are a few points to note.

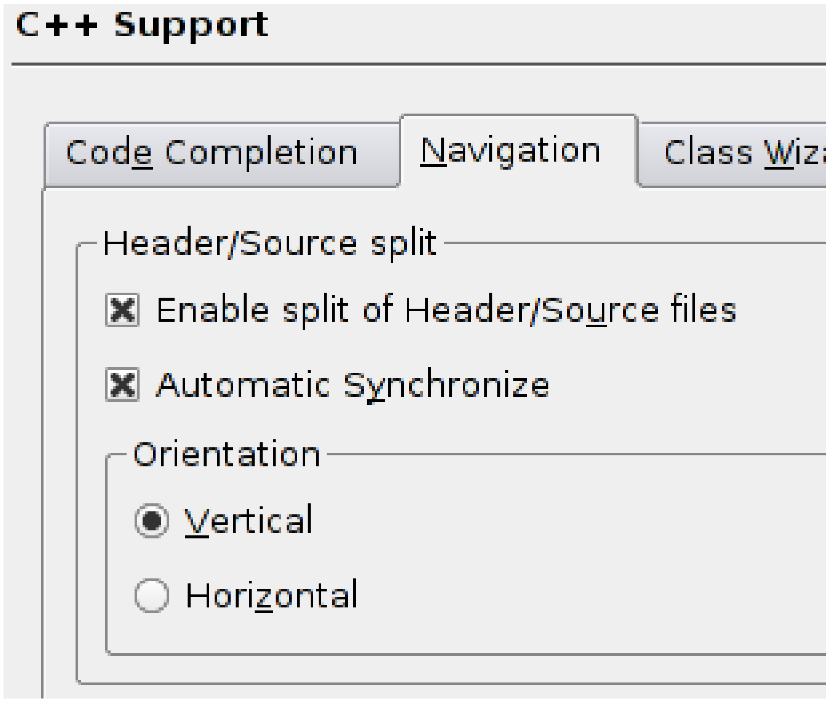
- The split workspace areas are fully functional at their own. This means, new tabbed windows will open in the workspace which contains the currently active editor window. And you can split any sub-area again to your wish, thus keeping as much windows open simultaneously as you need.
- Any split will move the currently active editor window into the new workspace sub-area, either downward or to the right. The other tabbed windows all remain where they were. You cannot directly move tabbed windows between split areas, instead you need to explicitly close the window in one workspace area and reopen it in another to regroup.
- Also, there is no direct way to close a split area again. It closes automatically, once the last tabbed window in it was closed.

2.4.3.4 Edit C++ Source and Header Files Simultaneously

There is a neat application of the above mentioned workspace split feature built into KDevelop. It allows to automatically keep a .cpp source and its accompanying .h header file side by side open in the workspace area. And, optionally, it allows to work on both files synchronously, such that if you select a declaration in the header file KDevelop will navigate to the respective definition in the source file and vice versa.

This feature is however deactivated by default. If you want to use it in your project you need to activate it.

Select Project → Project Options. The Project Options dialog will pop up. In the left hand icon bar there select C++ Support and subsequently the Navigation tab on the dialog page which will display on the right side.


C++ Support

Header/Source split

[✓] Enable split of Header/Source files

[✓] Automatic Synchronize

Orientation

● Vertical

○ Horizontal

Have C++ source and header files be displayed side by side.

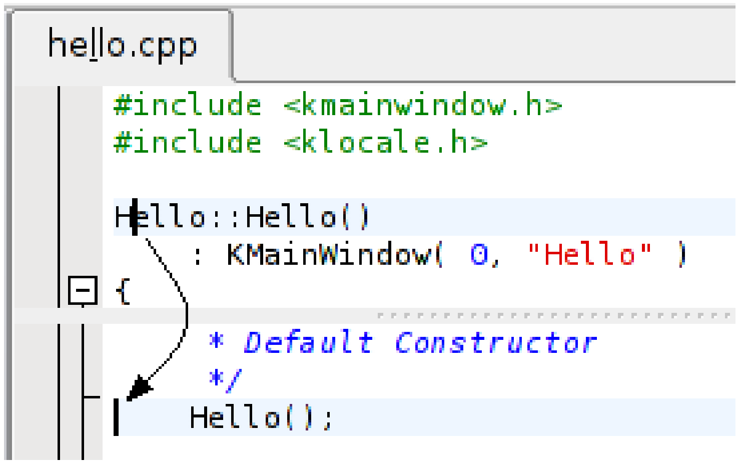
Now check the Enable split of Header/Source files box. This will enable Automatic Synchronize and Vertical by default. Keep these settings for now and press OK.

To illustrate this feature, now close in our example Hello project both the `hello.cpp` and `hello.h` editor windows, if necessary. Then select `hello.cpp` again from the `src` subdirectory of the project. The editor window will open as usual. But if you now open the `hello.h` belonging to it, KDevelop will automatically split the workspace and open this header file editor window just beneath the `hello.cpp` window.

There is even more, as we mentioned already. In the `hello.cpp` editor find e.g. this constructor definition line:

```
Hello::Hello()
```

and put the cursor there. Then look at the `hello.h` window below and note how KDevelop did navigate to the corresponding default constructor declaration line.



```
#include <kmainwindow.h>
#include <klocale.h>

Hello::Hello()
    : KMainWindow( 0, "Hello" )
{
    * Default Constructor
    */
    Hello();
```

KDevelop automatically navigated to the constructor declaration.

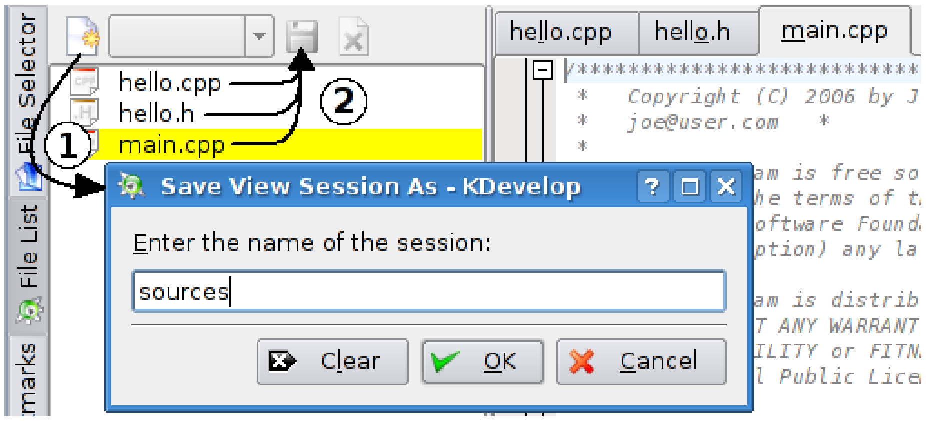
This works vice versa as well. Whenever you put the cursor somewhere into a construct in one editor window, KDevelop will navigate to the corresponding construct in the other.

2.4.3.5 Grouping Source Files Into Development Sessions

When your project grows larger, and the development tasks become more and more complex and force you to often switch between different, even distinct sets of files, it is about time to organize your development work into distinct sessions. The File List tool view of KDevelop allows you do to just this.

On top of the File List tool view window there is a tool bar where you can create, save, select, and remove such sessions. Or alternatively use the View → View Sessions sub-menu.

We will illustrate this facility again with our Hello example project. Assume you want to always open the `hello.cpp`, `hello.h`, and `main.cpp` files all in one step, no matter what development task you just did perform in the project. To accomplish this, you first need to create a new development session named, say, 'sources'.



```
/***************************
 *   Copyright (C) 2006 by J
 *   joe@user.com    *
 *
am is free so
he terms of t
oftware Found
ption) any la

am is distrib
T ANY WARRANT
ILITY or FITN
l Public Lice
```

Use development sessions to remember groups of files.

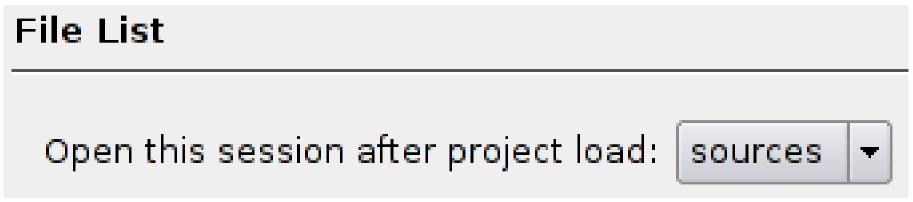
This is a multiple step approach as follows.

1. Create a new session
   (a) Click the New Session icon top left in the File List tool view window.
   (b) A dialog will pop up. In the Enter the name of the session input field give your new session a name, e.g. 'sources'.
   (c) Close the dialog with OK. The new session will now be listed in the drop down box on the toolbar.
2. This new session will initially be empty. You must populate it with the files you want to be kept there.
   (a) Open all files you want to be grouped in this development session. In our example we decided to keep `hello.cpp`, `hello.h`, and `main-.cpp` there as planned.
   (b) Once your file list is complete, click the Save Session icon in the toolbar. Do not skip this step, KDevelop will forget the file list otherwise.

That was it. Whenever you select the sources session from the Open Session drop down box, KDevelop will close all currently open editor windows and open the remembered ones (`hello.cpp`, `hello.h`, and `main.cpp` in our example) instead.

You can define as many sessions as you wish in the context of your project. If you want to change the session's contents, just update the remembered file list with a Save Session click. And if you want get rid of a session, select it in the drop down box, then click the Delete Session icon in the toolbar right.

There is even more. You can force KDevelop to open a given session by default when it loads the project. Just select the session in the drop down box on the Projects → Project Options → File List project options configuration page.



Let KDevelop open a specific session when the project is loaded.

2.4.4 Keeping an Eye on Common Problems

When you open an editor window containing a source file, KDevelop will parse its contents. This allows the built in *problem reporter* to scan the source text for some common errors it knows of. And it can alert the user of different places which have been marked for special treatment.

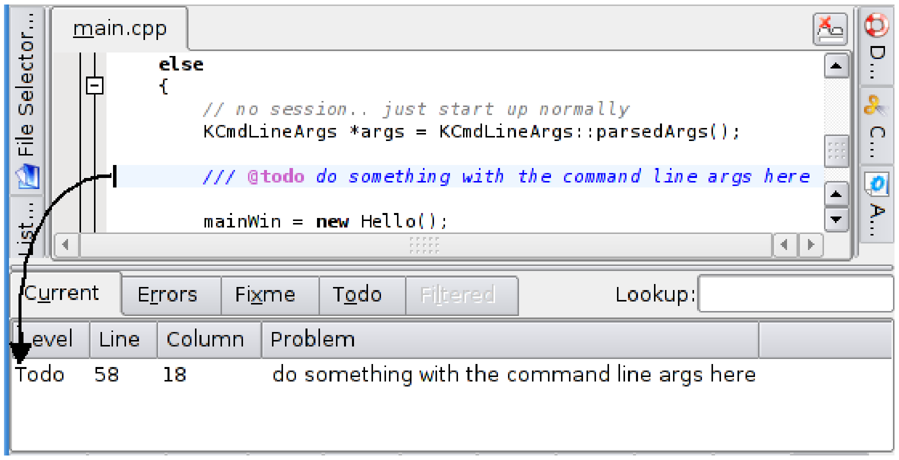
Let us illustrate this facility with our Hello example project.

- Open an editor window with the `main.cpp` source file.
- Make sure it still contains the following line somewhere towards the end:

```
        /// @todo do something with the command line args ↩
            here
```

  This was inserted by the Application Wizard when you created the Hello project in the Starting a New Project chapter above.

- Now open the Problems tool view in the bottom tabs row. If all went right, it will currently report this todo:



```
else
{
    // no session.. just start up normally
    KCmdLineArgs *args = KCmdLineArgs::parsedArgs();

    /// @todo do something with the command line args here

    mainWin = new Hello();
```

Level	Line	Column	Problem
Todo	58	18	do something with the command line args here

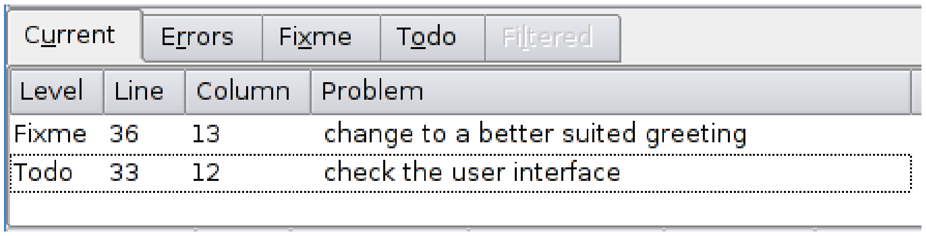
KDevelop is alerting a source code line containing a todo mark.

The format of the `/// @todo` command is for special treatment by the Doxygen code documenter, which we will look at briefly in the Documentation section below. It is not mandatory that you use this format, the more common `TODO` and `FIXME` comment marks will be recognized as well.

If you e.g. insert the following `TODO` and `FIXME` comment lines in our `hello.cpp` example file

```
Hello::Hello()
    : KMainWindow( 0, "Hello" )
{
    // set the shell's ui resource file
    // TODO check the user interface
    setXMLFile("helloui.rc");

    // FIXME change to a better suited greeting
    new QLabel( "Hello World", this, "hello label" );
}
```

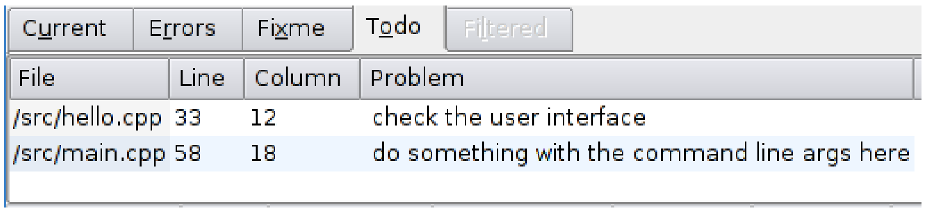
you will find them listed in the Problems tool view as well:



Level	Line	Column	Problem
Fixme	36	13	change to a better suited greeting
Todo	33	12	check the user interface

The problem reporter listing lines which require attention in the currently edited file.

Note the other tabs in the Problem reporter tool view window, especially Fixme, and Todo. If you open them, you will find all `FIXME` and `TODO` marked lines, KDevelop has found so far in this session. For example the `TODO` alerts will currently look thus:



File	Line	Column	Problem
/src/hello.cpp	33	12	check the user interface
/src/main.cpp	58	18	do something with the command line args here

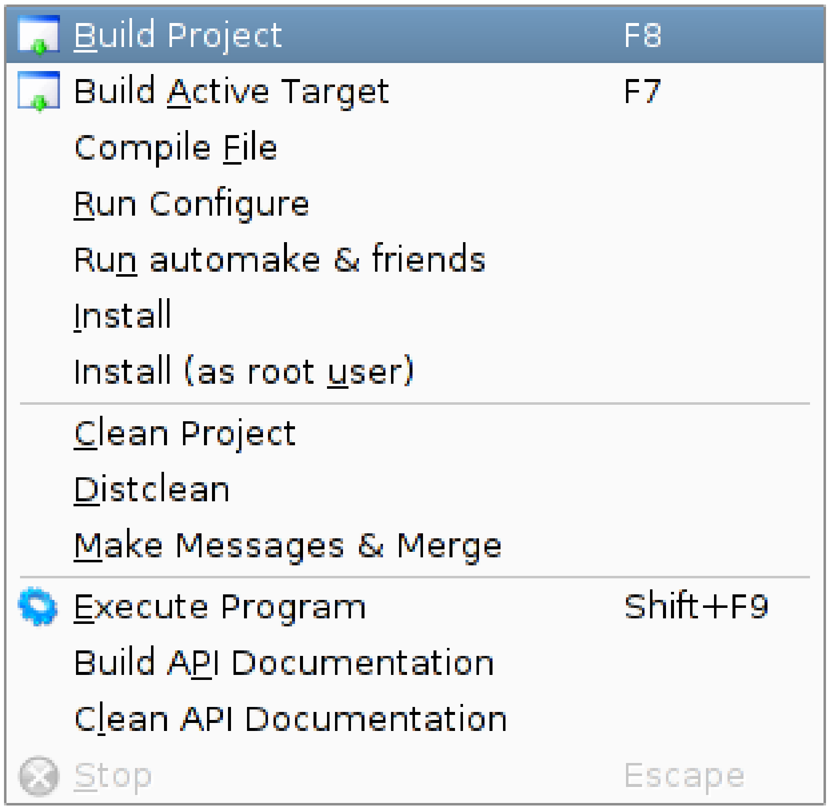
The problem reporter has collected the TODO alerts.

The Errors tab will however not list every coding error you make. This is the job of other tools in e.g. the build process. But you will find here alerts of some common programming mistakes which would likely go unnoticed otherwise and probably be catched with difficulties during complex debugging session.

You will find the KDevelop problem reporter facility a very valuable tool, so check the Problems tool view regularly in the development process.

2.5 How to Compile a Project

Compiling a project in KDevelop requires several setup steps and then building the application. All these are available through the Build menu.



Building a project requires several steps.

We are interested for now in the upper section only of this menu. The entries there are sorted in order of their importance. Thus the most often needed command is on top, the Build Project entry, which will cause all of the project be initialized, compiled and linked as needed. Other entries are there to compile selected project portions or a single file only, to perform several initialization sequences, or to install the completed application binaries.

For now we will concentrate on several facilities which KDevelop provides for project setup, initializing, building, and running an application. In general, this includes:

Looking briefly at the basic build cycle.
Looking at some basic means to configure a project.

2.5.1 The Basic Build Cycle

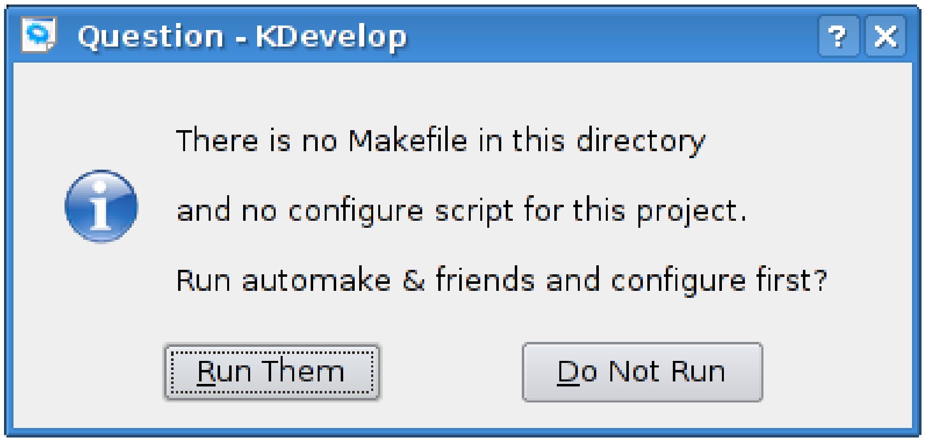
Once you created a new project you usually want to check if everything went right so far. This implies a first build and test run of the application, which we will do now. In order to initially compile a project there are several steps to perform, which we will briefly look at.

How to initialize the project for a first build.
How to do the initial configuration.
How to build the project.
How to run the application from within KDevelop.

> NOTE
> This discussion implies that your project is based on the GNU autotools, which enabled the Automake Manager tool in KDevelop as our example Hello project does. If you created another type project, e.g. for the Qt™ based QMake project manager, there will be other facilities available in the menus or perhaps even none of them. You will have to consult the respective vendor documentation on project management and application building in these cases.

2.5.1.1 Initialize the Project for the Build

When the Application Wizard created our Hello example project, it left it in a sort of raw, 'virgin' state. The GNU autotools chain dictates several initialization steps to be performed before the application could be actually compiled and linked. If you try to build a project in such a raw state, e.g. by selecting the Build → Build Project menu or pressing the **F8** function key, you will get the following warning.


Question - KDevelop

There is no Makefile in this directory

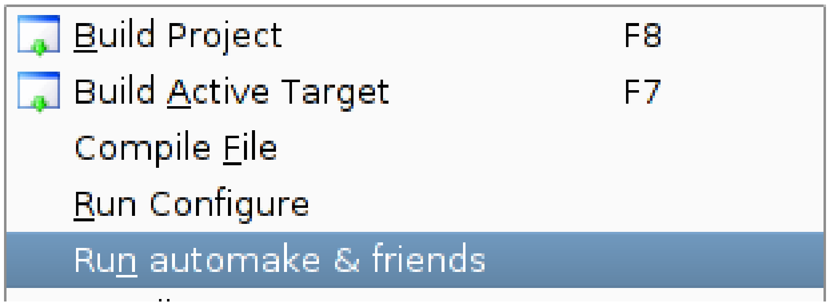
and no configure script for this project.

Run automake & friends and configure first?

Trying to build a raw automake based project.

You may press the Run Them button in which case KDevelop will try to automatically run all required setup steps prior to compiling and linking the application. But we will look at those initial steps in sequence, so cancel the dialog by pressing Do Not run.

As mentioned already, compiling and linking the application is done through the Build menu. Call it up and select Run automake and friends.



Initiating a basic initialization run.

KDevelop will now open the Messages tool view window at the bottom and list a series of messages produced by several make tools. If everything went right, the final line will read '`*** Success ***`'.

If you scroll back to the top, you will find the command line, KDevelop issued to call up the tools beneath the surface:

```
cd '/home/devel/projects/hello' && \
WANT_AUTOCONF_2_5="1" WANT_AUTOMAKE_1_6="1" gmake -f Makefile ↩
    .cvs
```

This basically tells that KDevelop first switched to the root directory of our example project. Then it set up a dedicated environment, advising the make system of the autoconf and automake tool revisions used for this initialization. And finally it instructed the make tool (GNU gmake in this case) to process the `Makefile.cvs` make file.

This make file was automatically set up when you created the Hello project. It contains all the commands necessary to properly initialize the project so the resulting application will run under KDE. Especially this will create the `configure` skript file necessary to perform the next setup step.

2.5.1.2 Initial Hello Configuration

Configuring means to tailor the build process to the hardware and software peculiarities of your system. This is a basic requirement in build processes based on the GNU autotools scheme as you probably will know.

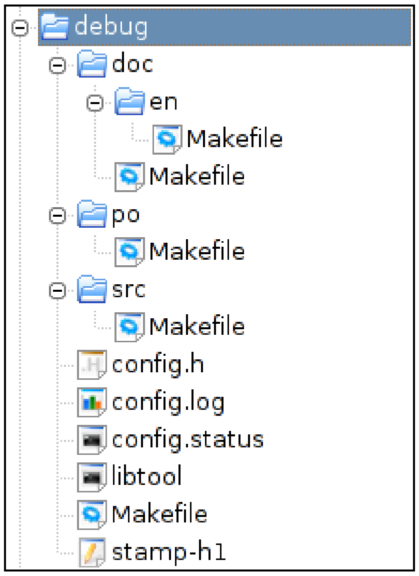
You can command a configure sequence once the basic automake initialization has been successfully finished because only after this initial run the necessary `configure` files will be available. This done, select the Build → Run Configure menu entry to initiate a configuration sequence.

KDevelop opened the Messages tool view window again if necessary and listed the messages of the configure run therein. If all went right, the final messages will be '`Good - your configure finished.  Start make now`' (which was issued by configure) followed by the KDevelop '`*** Success ***`' message.

On top of the Messages window you will again find the command line, KDevelop used to initiate this configuration run:

```
mkdir '/home/devel/projects/hello/debug' && \
cd '/home/devel/projects/hello/debug' && \
CXXFLAGS="-O0 -g3" "/home/devel/projects/hello/configure" -- ↩
    enable-debug=full
```

You can tell several interesting details from these commands.



- First, KDevelop uses a dedicated subdirectory in the project directory tree for the build process. This `debug` build directory (shown to the left) mirrors the basic project structure and contains some set of build related files, such as several `configure` based files and additionally a `Makefile` in each subdirectory.

- In the Configuring the Project section shortly below we will have a brief look at the motivations why KDevelop uses separate build directories in cases like this one. For the moment it is enough to know that KDevelop created this `debug` directory &#8212; if necessary &#8212; prior to the configure call and that the `configure` script did build the sub structure and all the `Makefiles` in there.

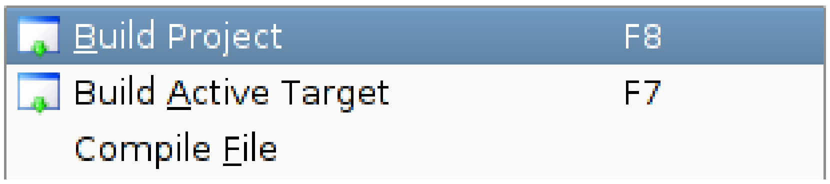
- Next, from within the `debug` build directory, KDevelop called the `configure` script in the root directory of our project using a dedicated environment, where the `CXXFLAGS="-O0 -g3"` flags will later signal the **gcc** compiler that it should not optimize the resulting binaries and include full debugging information with them.

- Finally the `configure` script was called with the `--enable-debug=full` option which instructs it to create each `Makefile` so that later compilation and linking will have all necessary debugging information be built in and usable.

All these settings are configurable on a per project basis. You will learn more about this in the Project Management chapter.

2.5.1.3 Build the Project

Once you got this far you will be ready to actually build, i.e. compile and link the application. Looking at the Build menu, there are three such compile options from which to select.



KDevelop commands to build binaries.

Going from bottom to top, there are:

- Compile File — This will compile the source file in the currently open editor window. Mostly used for quick error checks.
- Build Active Target — This is mainly used in conjunction with the Automake Manager which we will briefly look at below.
- Build Project — Now this is what we currently are interested in. It will iterate over the whole project, compiling and linking all files as necessary.

It might be interesting to watch what happens to the `Debug` directory created in the former `configure` run. So best keep it open with all subdirectories unfolded just as shown above. Then select Build → Build Project (or press the **F8** key) to initiate the build sequence. As before, the Messages tool view window will open at the bottom and list the outcome of this build run. And additionally some files will appear on the `Debug` subtree.

There are not many source files in our Hello example project, so the Messages window will contain only a few lines. On top of them again find the command line KDevelop issued to the underlying shell.

```
cd '/home/devel/projects/hello/debug' && \
WANT_AUTOCONF_2_5="1" WANT_AUTOMAKE_1_6="1" gmake -k
```

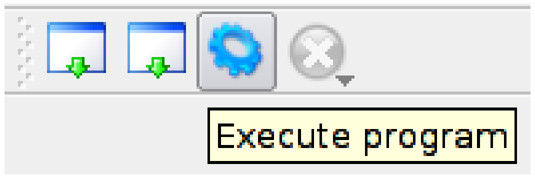
Not very surprisingly, KDevelop switched to the `Debug` subtree root in order to run the `Makefile` located there. A dedicated sub-environment was set up again as before in the Initialization step in which then the gmake tool was called.

Note the `-k` option in the gmake call. It forces the build process to continue up to its very end, even if errors will occur. This makes sense as KDevelop will list all error messages in the Messages window. If there are any, use the virtues of an IDE: Just click on the error message in the Messages window and KDevelop will take you to exactly the position where the error occurred in the source file.

And what did happen inside the `Debug` subtree? Not very much. A few files showed up on the `doc/en` and `src` branches, most notably the `hello` file in `/home/devel/projects/hello/debug/src/`. This, finally, is the application binary we were looking for. All what is left to do in our initial project check is to run this `hello`.

2.5.1.4 Run the Application

There are no extra steps involved to run this new Hello application. Either select Build → Execute Program or press Shift-F9 or use the Execute program button on the Build Toolbar shown below.



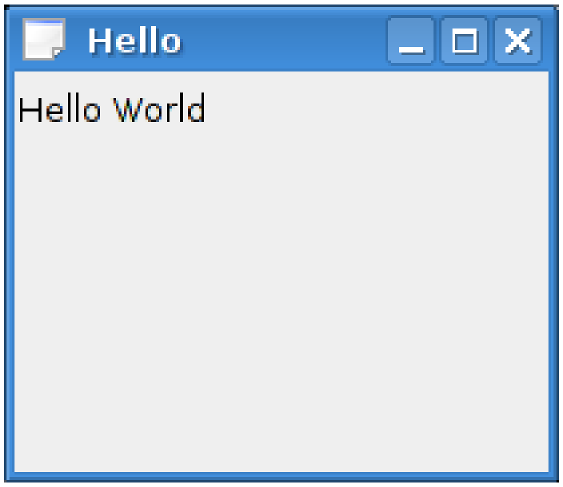
Running an application form the Build Toolbar.

That was all. KDevelop will now start the new application in the dedicated console window which opens as Application tool view on the bottom. There the command KDevelop issued to execute the program will be shown in the top line:

```
./hello
```

showing that the IDE has a notion about where the executable it shall run resides. This notion can be widely configured. See more about this in the Project Management chapter.

The `./hello` line will most likely be followed by a warning message. Ignore this for now. It does not keep our Hello form running.



Our initial Hello application.

Close the Hello application window as usual. If no errors occurred, KDevelop will report this as '`*** Exited normally ***`' in the Application tool view window.

2.5.2 Configuring the Project

In KDevelop there are numerous ways how you can manage your project. This behavior is configurable on a per-project basis and mostly of interest to the advanced developer. Yet there are a few project specific settings you should know of right from the beginning.

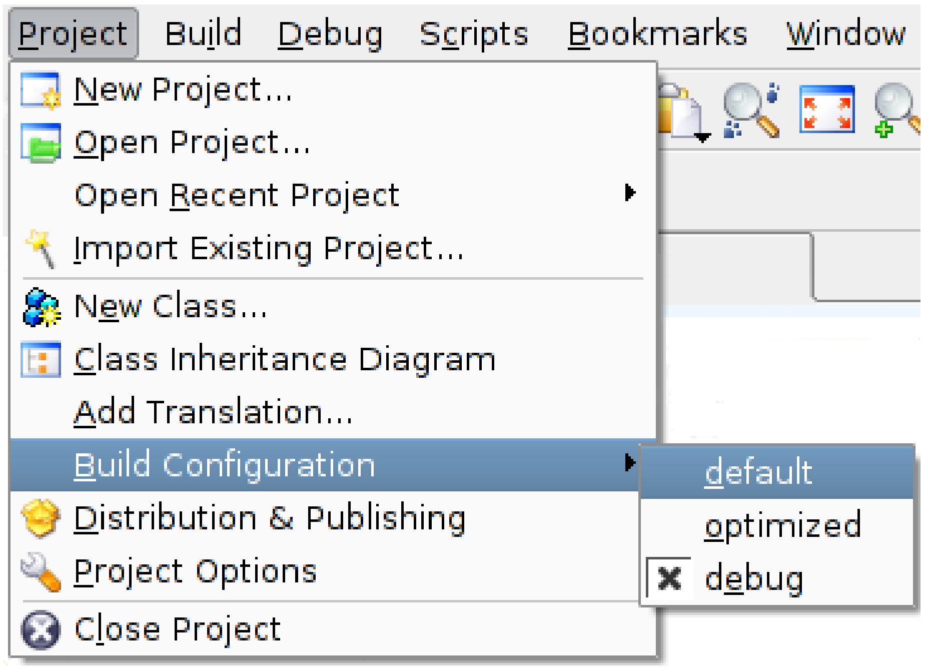
Of what use are build configurations?
Where to the define the behavior of the configure script.
Some considerations how make should run.
Where should the executable be and how should it be called?

2.5.2.1 Build Configurations

When we did a first run of the `configure` script in the Initial Hello Configuration section above, we noted that KDevelop had set up a dedicated `debug` subdirectory for this purpose. In this section we will briefly consider some consequences of this feature.

First of all, KDevelop does not necessarily use dedicated build directories apart from the source. The preparations to automatically use dedicated build configurations is done through templates the Application Wizard uses when creating a new project.

To find out which build configurations currently are available, have a look at the Project → Build Configuration menu.



There are various build configurations available for this project.

In this case, like our Hello example project, there are three different build configurations available. In other cases, there may — initially — be only one such build configuration, namely default.

The currently used build configuration has a check mark left to it. In order to switch to another build configuration simply select its menu entry.

Now let us have a brief look at what these build configurations provide.

debug You should use this as the standard build configuration during the development process. The build occurs separately from the source directories in the dedicated `debug` subdirectory, i.e. all object, auxiliary, and executable files will be put in the subdirectories there instead of their counterparts in the project root. The `configure` script will be given the `--enable-debug=full` option and the `CXXFLAGS="-O0 -g3"` will signal the **gcc** compiler to not optimize the code and to insert extensive debug information into the resulting binaries.

optimized This is used to build a final C++ application. The build occurs separately from the source directories in the dedicated `optimized` subdirectory. No specific arguments to the `configure` script will be preset, yet the `CXXFLAGS="-O2 -g0"` will signal the **gcc** compiler to optimize the code and to not insert debug information into the resulting binaries.

default The term 'default' denotes the standard setup when you build an application from the console using e.g. the GNU configure and make/gmake command line oriented build tools. Other than debug or optimize no dedicated build directory will be used. The application will by default be built in the sources directories instead. There are no special configuration switches predefined. Building and running the application will use the default settings of the underlying tools (e.g. **gcc**, etc.).

WARNING
Think twice before you decide to use the default build environment!
It cannot be used in parallel to the dedicated debug or optimized ones. *Any build operation using default will render both of the other build environments unusable.* This is caused by some peculiarities of the `Makefile` construction process using the automake/autoconf machinery, which cannot be easily overcome.

Now, why does one one want to use different build configurations at all, when they even appear to be not compatible to each other? The answer is — it simplifies edit-compile-debug cycles. The extra debug instructions inserted into the binaries as well as all those subtle structure changes to the program code made during optimizations will effect the run time behavior of the resulting application. So in many cases, when the logical structure of some routine appears to be correct, you may want to test whether it still behaves correctly under more practical conditions.

This is where the build configurations of KDevelop step in. Because the built object and executable files in each dedicated build directory and the build commands are kept separately from each other only source changes need to be handled when you switch between these build configurations.

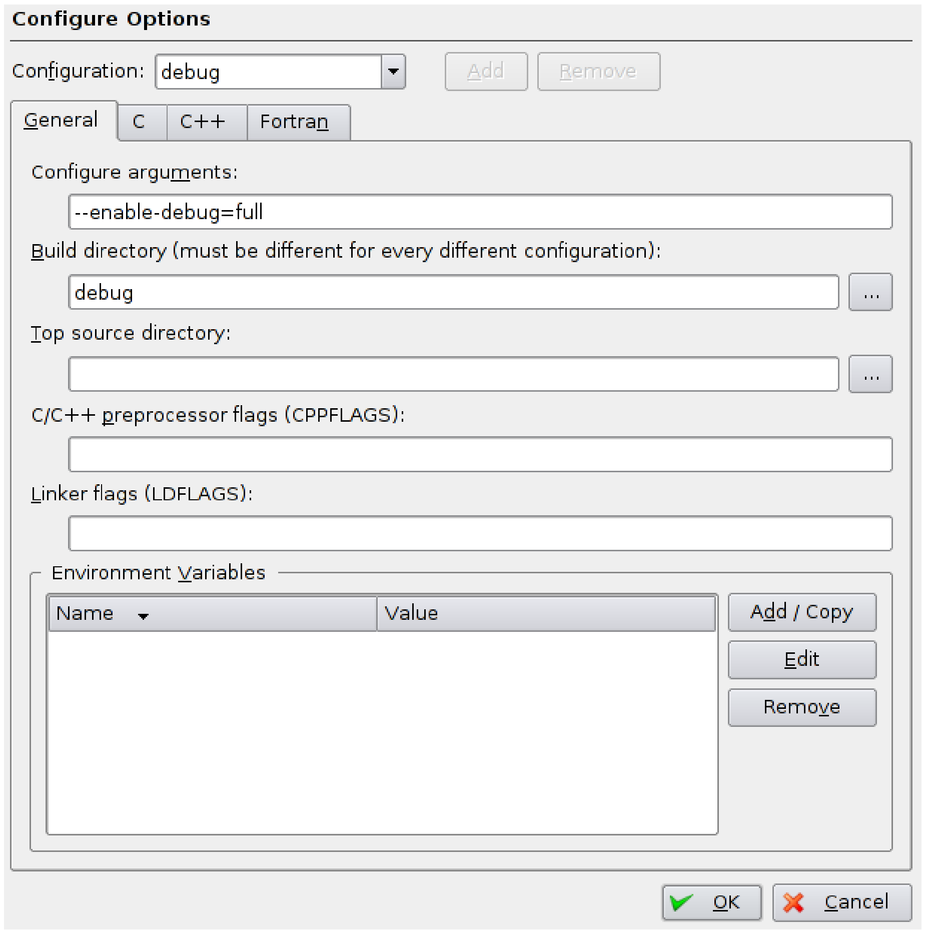
Thus instead of cleaning up and recompile everything from scratch with alternate options, you need only switch from the debug to the optimize build configuration, have the source changes compiled in and then retest the application under these circumstances. If anything inappropriate shows up, simply switch back to debug and immediately continue your work there.

A final note — many build configuration settings are configurable. You can even define your own build configurations if your development process requires some. We will briefly look at these possibilities in the next section.

2.5.2.2 Project Configure Options

Configuring the application properly is vital in the GNU autotools building chain. This is usually guided by option definitions to the `configure` script and/or specific flags settings in the environment prior to running `configure` as e.g. the `CXXFLAGS` in our previous discussions.

You may set most of the configuring options for a given project from within KDevelop GUI. Select Project → Project Options and then from the icon bar on the left of the dialog the Configure Options icon. The Configure Options dialog featuring several tabbed windows will display on the right handed side.


Configure Options

Configuration: debug

Configure arguments: --enable-debug=full

Build directory (must be different for every different configuration): debug

Top source directory:

C/C++ preprocessor flags (CPPFLAGS):

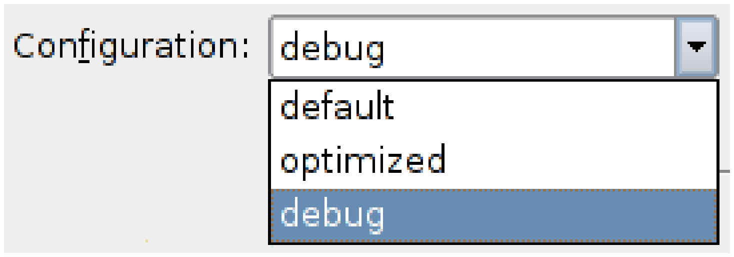
Linker flags (LDFLAGS):

Most configure options can be defined here.

As you see, there are quite a lot of options you can set up in this dialog. For now we will briefly look at only a few of them with regard to our Hello example project. For detailed instructions see the Configuring Projects chapter. If you want to know more about the meaning of the various flags which can be set, look up **info make** from the console (or **info:make** from within Konqueror) and there the Implicit Rules → Implicit Variables section.

There are several tabbed dialog setup windows from which the first one, General, refers to commonly used settings, while the others are rather compiler specific. In all cases, however, will the actual contents of those dialogs be governed by the given build configuration.

You select the build configuration whose configuration settings have to be defined from the Configuration combo box on top of the Configure Options dialog.



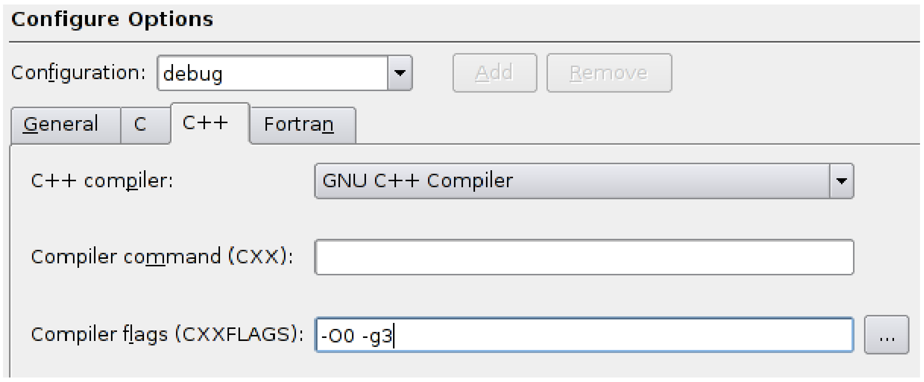
Select the build configuration whose settings to define.

Now select another build configuration from this combo box and note how the contents of e.g. the Configure arguments and Build directory text boxes change according to the settings we mentioned in the build configurations list above.

2.5.2.2.1 General Configuration Settings On the General dialog page, these configuration options can be defined:

- **Configure arguments** These are the options KDevelop assigns to the `configure` script call in the build process. See the example in the 'Initial Hello Configuration' section above.
- **Build directory** This is the subdirectory in the current project root, where KDevelop will put all files created in the build process. Ideally, this should correspond to the name of the build configuration in use, but you are free to use any name you like, provided it is different from any other build configuration directory.
- **Top source directory** You won't need this one often. It defaults to the project root directory and needs only be redefined if your project sources are located in another place.
- **C/C++ preprocessor flags (CPPFLAGS)** Put specific instructions for the preprocessor here. KDevelop will use this to set up a temporary environment before it calls the actual build tool. Again, see the example in the 'Initial Hello Configuration' section above how this is done.
- **Linker flags (LDFLAGS)** This is extra information for the ld linker tool where it should look for additional libraries. It is used to build the temporary build environment as well.
- **Environment Variables** Here you may define additional variables to be set up in the temporal build environment, KDevelop will set up before calling the respective build tool. Again, you must define these environment variables for every build configuration where they are to be used.

2.5.2.2.2 Compiler Specific Settings The other tabs on the Configure Options dialog page are for compiler specific settings. They are similarly structured, so it suffices to have a brief look at the C++ page.



Configuration: debug

C++ compiler: GNU C++ Compiler

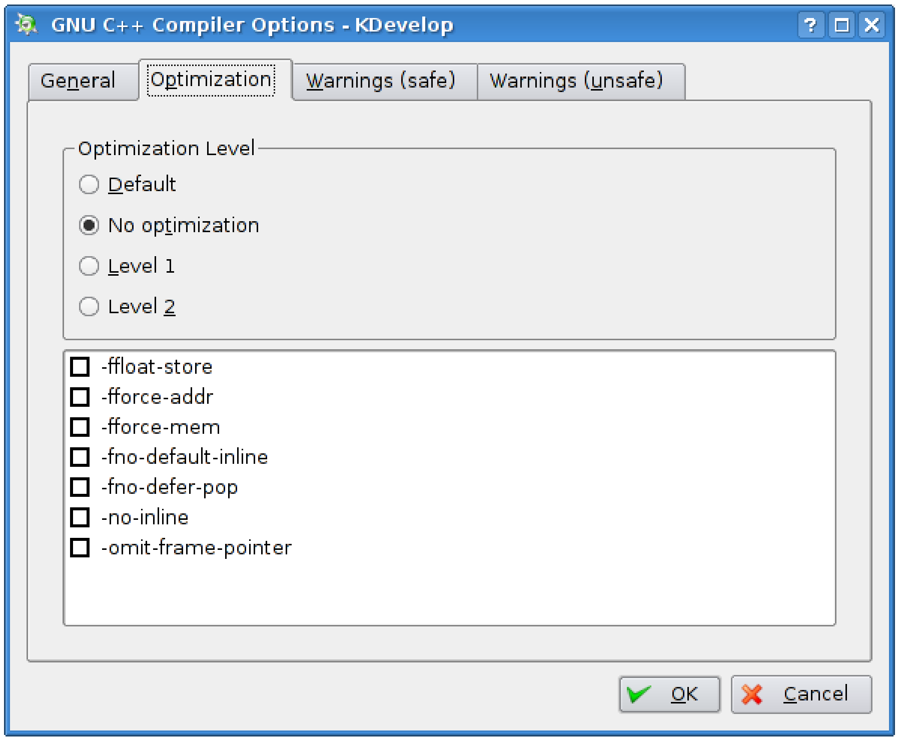
Compiler command (CXX):

Compiler flags (CXXFLAGS): -O0 -g3

Select the compiler and its working environment KDevelop shall use here.

This is what you can set up from here:

- **C++ compiler** Select the C++ compiler KDevelop should regularly use from this combo box. It however lists only those compilers KDevelop really knows of.
- **Compiler command (CXX)** Only for experts. This is only needed if the C++ compiler is not standard. Put the name by which it is called here.
- **Compiler flags (CXXFLAGS)** Here you can enter any extra option KDevelop shall pass (via the `Makefile`) to the compiler. Some option values will be preset according to the build configuration selected in the Configuration combo box.
  Note, that many common compiler options can be selected from a dialog which will pop up when you press the ... button to the right of the text box.



Optimization Level

- ○ Default
- ● No optimization
- ○ Level 1
- ○ Level 2

- ☐ -ffloat-store
- ☐ -fforce-addr
- ☐ -fforce-mem
- ☐ -fno-default-inline
- ☐ -fno-defer-pop
- ☐ -no-inline
- ☐ -omit-frame-pointer

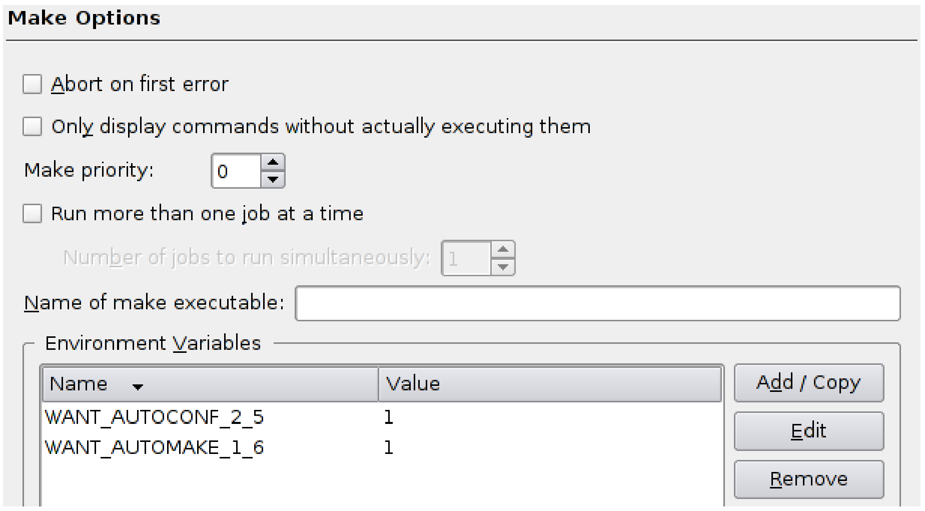
Use this dialog to define the GNU C++ compiler behavior.

We deliberately selected the Optimization tab here. Note how the No Optimization option has been preselected (according to the `-O0` option preset in the `debug` build configuration).

Unfortunately you cannot currently select all options from this dialog. The `-g3` option e.g. used by the `debug` build configuration would have to be altered manually if ever needed.

2.5.2.3 How Make Should Build the Program

You can as well configure the way KDevelop will call the make tool in the project build. Select Project → Project Options and then the Make Options icon from the left dialog window side. The Make Options dialog page will then be displayed to the right.


Make Options

- [ ] Abort on first error
- [ ] Only display commands without actually executing them

Make priority: 0

- [ ] Run more than one job at a time

Number of jobs to run simultaneously: 1

Name of make executable:

Environment Variables

Name	Value
WANT_AUTOCONF_2_5	1
WANT_AUTOMAKE_1_6	1

Define how KDevelop will call the make tool.

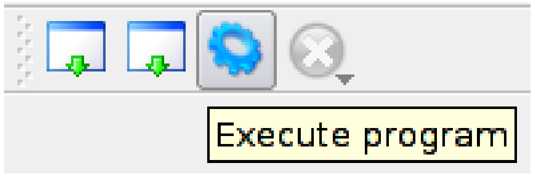
There is not much to do here for now. The only setting of interest in most cases will be the Abort on first error switch. You will find it deactivated in most projects. This corresponds to the `-k` option in the gmake call we found in the initial build of our example Hello project.

This makes sense in an IDE like KDevelop which will protocol any error message during the build. After the build process you may easily navigate to any error message in the Messages tool window. Use View → Next Error and View → Previous Error or respectively the **F4** and Shift-F4 keys for this. KDevelop will automatically activate the editor window of the source file in question and put the cursor on the error line.

If on the other hand you rather want the build be stopped on whenever an error occurs, check the Abort on first error option in this dialog. KDevelop will then call gmake without the `-k` option.

2.5.2.4 How to Run the Executable

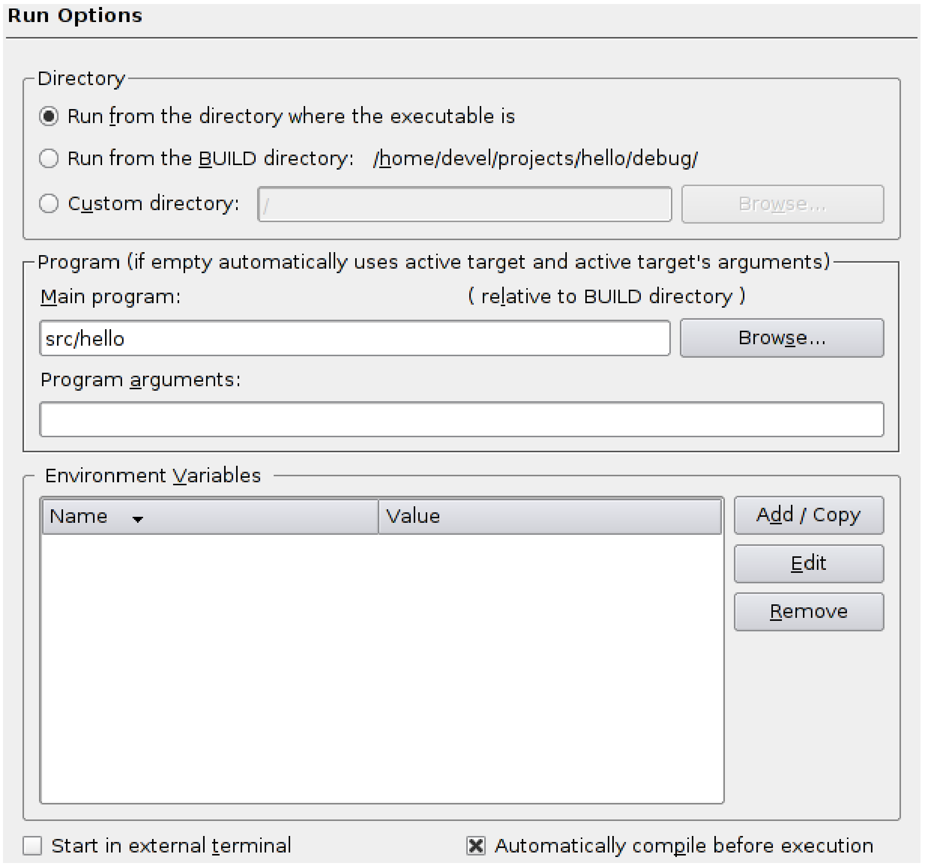
Once the build is complete, you can easily run the application from within KDevelop. Use either Build → Execute Program, the Shift-F9 keys, or the Execute program button in the Build Toolbar of KDevelop.



Run the program from here.

But where is the executable located which should be run? How does one have KDevelop append options to the call? Or, how can I have the application executed in a terminal by its own to test its console interactive behavior?

All this can be solved by configuring some project oriented run options in KDevelop. Select Project → Project Options and then the Run Options icon from the icon bar on the left dialog window side. The Run Options dialog page will display to the right.



Run Options

Directory
- ● Run from the directory where the executable is
- ○ Run from the BUILD directory: /home/devel/projects/hello/debug/
- ○ Custom directory: /

Program (if empty automatically uses active target and active target's arguments)
- Main program: (relative to BUILD directory) src/hello
- Program arguments:

Environment Variables

Name	Value

- ☐ Start in external terminal
- ☒ Automatically compile before execution

Define where and how your program shall be run.

Now, there is quite a lot which can be set up from this dialog. Basically there are four groups of configuration items.

- **Directory** This tells KDevelop where it basically shall assume the executable to be called. There are three possibilities you can select from.

  Note however that only root directories are defined here. KDevelop usually looks for the executable in some subdirectory given in the next configuration group.

  – Run from the directory, where the executable was build the last time. This is the default. You can keep this for now.

  - Run from the build directory according to the currently selected build configuration. The name of this directory was set up on the General Configuration dialog page.

    This is the root where KDevelop will find the executable. It changes automatically with the selection you made in Project → Build Configurations menu. Try it.

    Other than always running the most recently built executable according to the setting above, this allows you to switch the program to be executed by simply selecting another build configuration from the Project menu.
  - Run the executable found in a fixed custom directory. Again this is the root only from where the actual executable is to be found.

    Use this if you e.g. want to run the actually installed program instead of the version located in the project directories.

- **Program** This tells KDevelop the relative position and name of the program it shall actually call. This is relative to the root directory defined in the configuration group above. Furthermore you can define any argument KDevelop will pass to the program when it is actually called.

NOTE

If leave the Main program text box empty, the *active target* settings of the Automake Manager will be used. Although this is an expert setting, inadvertently leaving this input field blank is a common cause of problems. Check this setting if KDevelop appears not to call the executable you wanted.

- **Environment Variables** KDevelop will set up a dedicated shell environment to run the program in. Define any extra environment variable in this configuration group.
- **Miscellaneous** Two more check boxes are located at the bottom of this dialog page.
  - Automatically compile before execution comes in handy most of time. KDevelop will check the project for changes and perform necessary configure and build steps for you any time you command it to run the program.

    Uncheck this in case you want to run the program version prior to the last change.
  - Start in external terminal is interesting if you want to test the input/output behavior of non-GUI programs in a console terminal. This is unchecked by default, so KDevelop does start the program in a window of its own without console terminal I/O capabilities.

2.6 How to Extend a Project — the Automake Manager

(- to be written -)

2.6.1 A Short Look at the Automake Machinery

(- to be written -)

2.6.2 How to Place Icons in a Separate Directory

(- to be written -)

2.6.3 How to Add New Classes

(- to be written -)

> CAUTION
> Be careful when you select your class file names. It is extremely difficult to change them later.

2.6.4 What is in a Subproject?

(- to be written -)

2.6.4.1 Concentrate on Your Work — the Active Target

(- to be written -)

2.6.5 Some Steps to Restructure a Project

(- to be written -)

2.7 How to Debug

(- to be written -)

2.8 A Note on Your Project Documentation

The KDE project uses docbook for generating your project handbook (i.e. the user manual). The user manual is available through your application menubar by choosing Help → *`YourApplication`* Handbook when your KDE GUI application is running. After building your project, the user manual is displayed in

KDE KHelpCenter. It should explain to the user how your application works, what are the main features and how to configure it. It should also explain the advanced features if any.

All KDE based templates in KDevelop have a doc subdir which contains a `index.docbook` template in the en folder to get you started in writing the user manual. You should edit this `index.docbook` in KDevelop and start changing personal details such as name, email, etc.. Look at the comments in this file and try following these indications to start your application documentation. Rebuild your project to see the changes in KHelpCenter.

> **NOTE**
> You need to install your project using Build → Install or Install (as root user) in KDevelop to see the user manual in KHelpCenter.

You can find more about the docbook syntax on the KDE documentation website.

2.9 Last But Not Least, Keyboard Shortcuts

(- to be written -)

2.10 Where to go from here

(- to be written -)

2.10.1 Frequently Encountered Problems

The nutshell chapter
FAQ pages
Forum
Mailing lists

2.10.2 Working With Projects

(- to be written -)

2.10.2.1 Using Existing KDevelop Projects

(- to be written -)

2.10.2.2 Importing External Projects

(- to be written -)

Chapter 3

Overview of KDevelop Features

Bernd Pol KDevelop integrates a lot of tools, scripts, and templates in a common user interface. Basically it consists of

- several user interface modes from which you can select the look and feel of the workspace,
- an Application Wizard which aids you in setting up a new project,
- several project management systems which aid in building and managing your project,
- some editing tools to easily work on your program texts
- various file browsers providing you different views on your file system,
- various class browsers to aid you in maintaining the classes and their relationships of your object-oriented programming project,
- a debugger interface to find and remove program errors from within KDevelop, and
- several plugin tools, extensible modules which can be loaded at runtime and on demand. This allows you to only turn on those features you really need.
- a set of other diagnosis, documentation, and optimization helper tools.

NOTE
In fact there are three KDevelop-based applications:

- The KDevelop IDE — this is the place where you will usually work.
- The stand-alone KDevelop Assistant documentation browser — isolates all the powerful documentation facilities of the KDevelop IDE in a separate tool. This comes in handy when you want to look up some programming documentation but do not want to start the full IDE.
- The KDevelop Designer — enhances the Qt^{TM} User Interface Designer by KDE specific elements and integrates nicely in the KDevelop IDE.

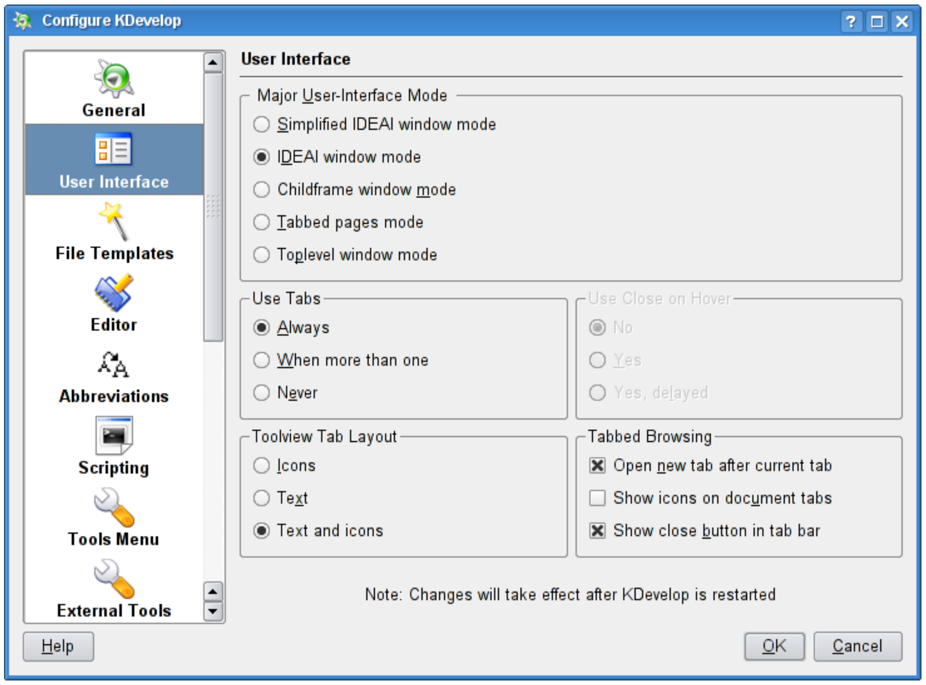
3.1 Available User Interface Modes

KDevelop offers developers four separate user interface modes (click on the mode name to view an example):

- IDEAl
  This is a novel user interface approach optimizing both work space and intuitive handling of the tools.
  - All tool views are docked in a tabbar fashion around the mainframe area. They are grouped left, bottom, and right according to the services provided.
  - Editor and browser views will be stacked in a big sized tabbed window inmidst the mainframe area.
- Child Frame Windows
  - All tool views are initially docked to the mainframe.
  - Editor and browser views will live like toplevel windows within a view area of the mainframe.
- Tabbed Pages
  - All tool views are initially docked to the mainframe.
  - Editor and browser views will be stacked in a tabbed window.
- Toplevel Windows
  - All editor, browser, and tool views will be toplevel windows directly on the desktop.
  - The main widget only contains the menu, toolbars, and statusbar.

3.1.1 How to Switch User Interface Modes

To switch the user interface mode select Settings → Configure KDevelop... from the menus. The Customize KDevelop dialog will pop up, where you have to select User Interface in the left hand tree. This will display the settings page shown below.



User Interface

Major User-Interface Mode
- Simplified IDEAl window mode
- [✓ IDEAl window mode]
- Childframe window mode
- Tabbed pages mode
- Toplevel window mode

Use Tabs
- [✓ Always]
- When more than one
- Never

Use Close on Hover
- [✓ No]
- Yes
- Yes, delayed

Toolview Tab Layout
- Icons
- Text
- [✓ Text and icons]

Tabbed Browsing
- [✓ Open new tab after current tab]
- Show icons on document tabs
- [✓ Show close button in tab bar]

Note: Changes will take effect after KDevelop is restarted

Select a user interface mode

(Older KDevelop versions provide the top mode selection section only.)

In the Major User-Interface Mode section select the radio button of the user interface mode you want to work in.

Dependent on the user interface mode you selected, other configuration sections will become available where you can taylor more details of the look and feel to your preferences. See the Selecting the User Interface chapter for more detail.

NOTE
Do not forget to restart KDevelop in order to let your selections take effect.

3.1.2 How to Maximize the Work Space Area

To maximize space, there is a full-screen window mode available which expands the mainframe area to the screen borders. Additional space can be reclaimed by hiding the menubar. And you can of course hide any toolbar as usual in KDE applications.

Full Screen Mode To switch to or from full screen mode select View → Full-Screen Mode from the menus or press Ctrl-Shift-F. There is also a Full-Screen Mode icon in the Browse Toolbar available.

Hide/Unhide the Menubar To *hide* the menubar select Settings → Show Menubar from the menus or press Ctrl-M. You may also include a Show Menubar icon in a suiting toolbar, e.g. the Browse Toolbar for that purpose. To *unhide* the menubar you must press Ctrl-M or use the Show Menubar icon if available.

3.2 Elements of the User Interface

(... to be written ...)

3.2.1 The Workarea

(... to be written ...)

3.2.2 The KDevelop Titlebar

(... to be written ...)

3.2.3 The KDevelop Statusbar

(... to be written ...)

3.2.4 The menubar

(... to be written ...)

3.2.5 The Toolbars

(... to be written ...)

3.2.6 The Tree Tool Views

(... to be written ...)

3.2.7 The Output Tool Views

(... to be written ...)

3.3 Project Management Systems

Globally, a project will rely on some form of project management system. KDevelop offers four *project management systems* the programmer can select from when creating a new project.

- Automake projects use the GNU standard development tools.
- QMake projects use the trolltech QMake project manager.
- ANT projects use the Apache ANT project manager for Java^{TM} development.
- Custom projects require you to maintain your own `Makefiles`.

3.3.1 Automake Projects

Projects created with KDevelop's Automake Manager make it very easy for developers to use the GNU standard development tools. They provide

- a better way of `Makefile` generation and
- a good and safe way for fast adaption towards different systems by autoconf-generated `configure` scripts.

3.3.2 QMake Projects

For developers who enjoy the flexibility and feel of Qt^{TM}'s qmake system, KDevelop offers the ability to handle qmake based projects (.pro files) within the GUI.
For more information on the QMake project manager see the 'qmake User Guide' which should be included in your distribution or have a look at the TROLLTECH Documentation home page where you may find the QMake documentation of your 'Qt C++ GUI Application Development Toolkit' version.

3.3.3 CMake Projects

CMake will be the KDE build system for KDE 4 and KDevelop already provides you some CMake based templates in C and C++. You only need the cmake program in your `$PATH` to build them.

To set up a new C or C++ project in KDevelop select Project → New Project... → C or C++ → CMake based projects → A shared library template or Hello world program.

3.3.4 ANT Projects (Java^{TM} Projects)

Java^{TM} developers may want to use the Apache ANT project manager for their projects. To set up a new Ant project in KDevelop select Project → New Project... → Java → Ant Project → Application.

For more information see The Apache Ant Project home page.

3.3.5 Custom Projects

If you prefer to maintain your own `Makefiles` for your project you may use the custom project option of KDevelop. This may be feasible in unusually structured projects or if you want to retain full control over the **make** process.

Yet, if you do not *really need* the extra flexibility and control of the custom project manager you should consider Automake Manager or one of the other project managers, because they considerably ease the program building and distribution processes.

3.3.6 How to Distribute Your Application

The distribution of your applications does not require the end-user to have anything different installed other than

- an appropriate compiler,
- a linker, and
- the appropriate development libraries,

which at least for C++ applications is most often the case. But you can as well distribute *binary packages* of your application. In either way, the end-user of your product does not need KDevelop installed.

For giving away your sources, we advise to include the *project file* of KDevelop as well. This makes it very easy for other developers—if they use KDevelop—to work with your sources.

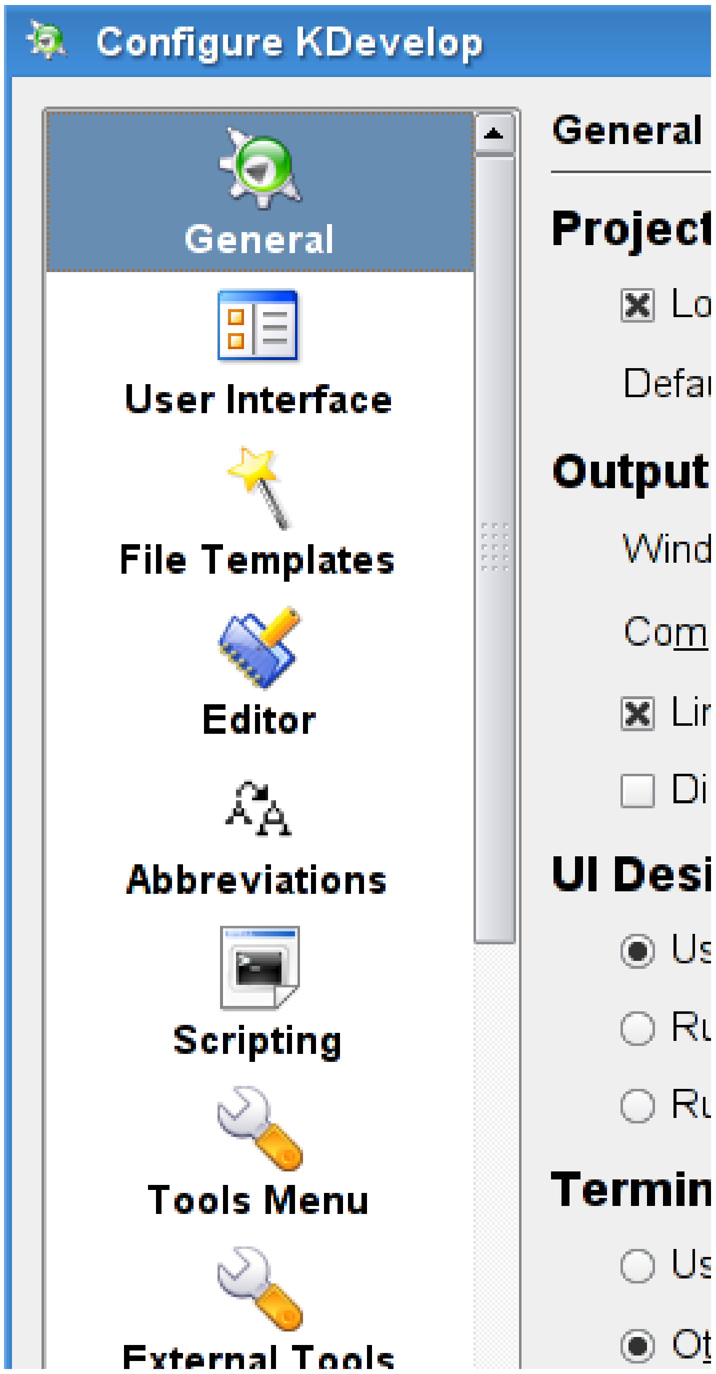
For projects where *several developers*, maybe working on different places, are involved, this should be the case anyway. So you can ensure consistency of the `Makefiles` to not run into trouble.

Especially on multi language applications, *translators* won't actually work with the source code, except in cases that require correction for enabling translation support.

Chapter 4

Configuring KDevelop

Bernd Pol KDevelop is a very powerful and flexible IDE which offers many ways to tailor it to your needs. To start configuration select Settings → Configure KDevelop.... This will cause the configuration dialog to pop up consisting of a selection window to the left and the configuration dialog on the right hand side whose contents will vary upon the configuration item you did select.



Select a configuration item

We will discuss these configurations in a different order, split up into the main topics of General Configuration, Configuring the Documentation, and Advanced Configuration which makes for a more intuitive reading.

If you want directly look up a certain configuration item use one of the following links.

General
User Interface
File Templates
Editor
Abbreviations
Scripting
Tools Menu
External Tools
Documentation
Code Snippets
File List
File Selector
C++ Class generator
Formatting
C++ Parsing

4.1 General Configuration

General configuration concerns the more common tasks of tailoring KDevelop as there are:

- General Setup
- Selecting the User Interface
- SOURCE EDIT TASKS
  - Selecting an Editor
  - Selecting a Source Format Style
  - Setting Up the Code Snippets Tool
- Configuring the File Selector

4.1.1 General Setup

The General configuration dialog allows you to define some basic KDevelop behaviour which seldom will change in everyday work. This concerns:

General project options such as

- defining a default parent directory KDevelop shall use for new projects.

- deciding whether you want KDevelop to automatically load the project you last worked on.

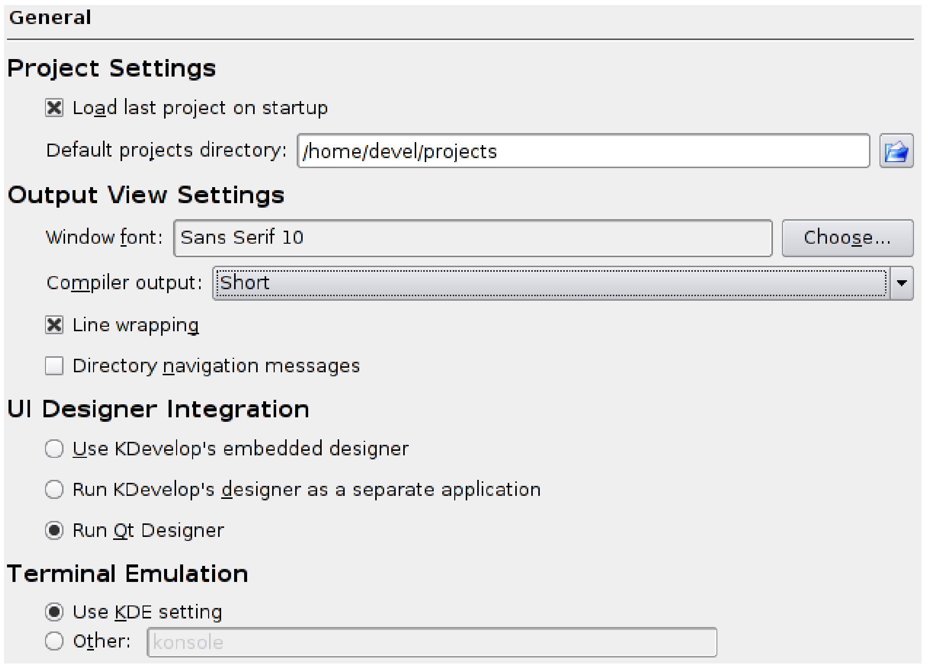
Selecting a font for the most commonly used output view windows, namely:

- the Messages Output View KDevelop uses to communicate e.g. compilation progresses, and
- the Application Output View which will show error and state information concerning a running application.

Some common behaviour concerning the displayed lines in the Messages Output View window, namely:

- whether long lines will wrap around, and
- if directory entry and exit messages issued by **make** will be shown.

The level of detail of messages concerning the compilation process shown in the Messages Output View window.


General

Project Settings

[✓] Load last project on startup

Default projects directory: /home/devel/projects

Output View Settings

Window font: Sans Serif 10 Choose...

Compiler output: Short

[✓] Line wrapping

[ ] Directory navigation messages

UI Designer Integration

○ Use KDevelop's embedded designer

○ Run KDevelop's designer as a separate application

● Run Qt Designer

Terminal Emulation

● Use KDE setting

○ Other: konsole

The general configuration dialog

Load last project on startup Mark this checkbox if you want to continue to work with the last project you worked on. This will cause KDevelop to automatically load this project on start-up. It will usually be shown in the state you left work so you can readily proceed.

Default projects directory: By default, KDevelop uses a common parent directory for all new projects. Enter the absolute path of this common directory in the box or select it from your directory structure. KDevelop will place the any new project here as a subdirectory.

> NOTE
> You may of course change the directory path of a new project at the time you set it up in the Application Wizard.

Window font: The Application Output View window is used to display error and state information from applications which are run from inside KDevelop. These are informations the applications usually sends to the console when run stand-alone. So you do not need to leave the IDE when testing the application you currently work on.

To select a font suitable for the Messages Output View window click the Window Font button showing the currently selected font (it says 'Luxi Sans' in the above illustration). The KDE standard Select Font dialog will pop up from which you may select the font to be used.

> NOTE
> On first start-up, KDevelop initializes this font setting to the standard font for which your KDE user has been configured. *This setting is fixed*, so if you alter Preferences → Appearances & Themes → Fonts in the Control Center, this will not effect this KDevelop font selection. You will have to explicitely reselect the Messages Output View window font.

Compiler Output KDevelop preprocesses the messages the Messages Output View window receives during the build processes in order to filter superfluous information. You can control the level of detail KDevelop will display using the dropdown box in this field.

Very Short Displays only warnings, errors, and the filenames which are compiled.

Short Suppresses all compiler flags and formats the output to be more readable.

Full Displays all output messages unmodified.

> TIP
> There is an alternative way to switch the compiler output detail. Just right click in the Messages Output View window and select the according detail level from the popup menu.

Line wrapping By default, KDevelop will wrap long lines around in the Messages Output View window so that valuable information will not be easily overlooked. In some cases this will clutter long message lists. Remove the checkbox mark if you do not want the lines wrap around.

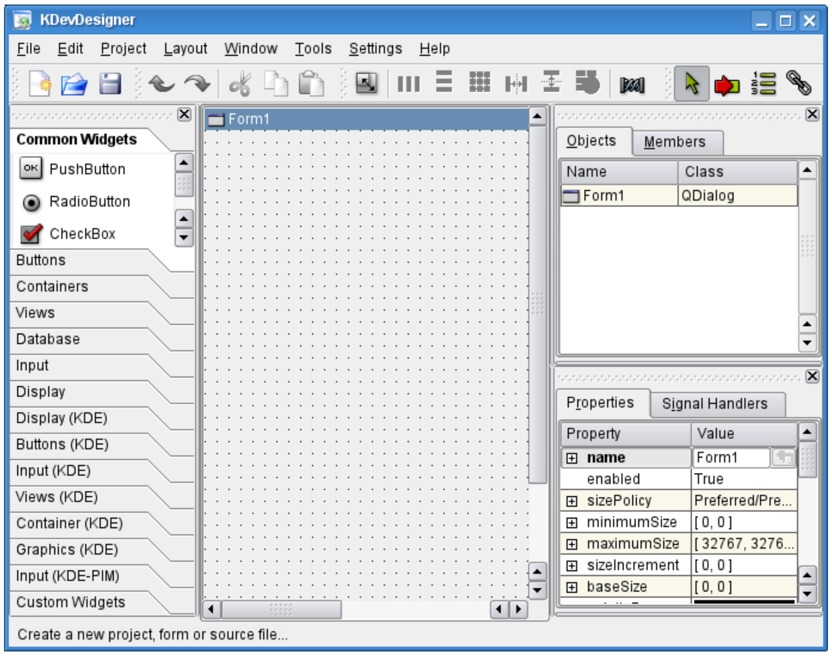
TIP
There is an alternative way to switch the line wrapping. Just right mouse button click in the Messages Output View window and mark/unmark the Line Wrapping entry in the menu which will pop up.

Directory navigation messages The **make** tool usually will display messages like 'Entering directory', or 'Leaving directory' when it switches the directories it currently works in. As this clutters the messages list in the Messages Output View window, KDevelop suppresses those messages by default. Mark the checkbox if you want to protocol which directories **make** worked in.

NOTE
Changes in this setting effect the processing of new messages only. Old directory navigation messages will be kept visible when you switch this feature off.

UI Designer Integration This let you choose the way you want `.ui` files to be displayed in KDevelop. KDevelop comes with its own UI designer called KDeveDesigner that can either be embedded or be run as a separate program. Qt Designer can also be used to edit `.ui` files.

- Use KDevelop's embedded designer
  This uses KDevelop own designer embedded within KDevelop
- Run KDevelop's designer as a separate application
  The KDevDesigner application will be run separately in its own window.



Name	Class
Form1	QDialog

Property	Value
name	Form1
enabled	True
sizePolicy	Preferred/Pre...
minimumSize	[0, 0]
maximumSize	[32767, 3276...
sizeIncrement	[0, 0]
baseSize	[0, 0]

Create a new project, form or source file...

KDevDesigner in its own window

- Run Qt Designer
  Qt Designer from your Qt installation will be started externally whenever you click on a `.ui` file in KDevelop.

Terminal Emulation You choose here which terminal you want to be integrated within KDevelop.

- Use KDE setting
  This uses KDE setting as set in KControl in KDE component Component Chooser tab which sets the default terminal emulator used by all KDE applications that need a terminal.
- Other
  Choose some other terminal different from the default one.

4.1.2 Selecting the User Interface

As already said in the Available User Interface Modes chapter there are five different ways the KDevelop work area may be set up, namely:

- Simplified IDEAl window mode

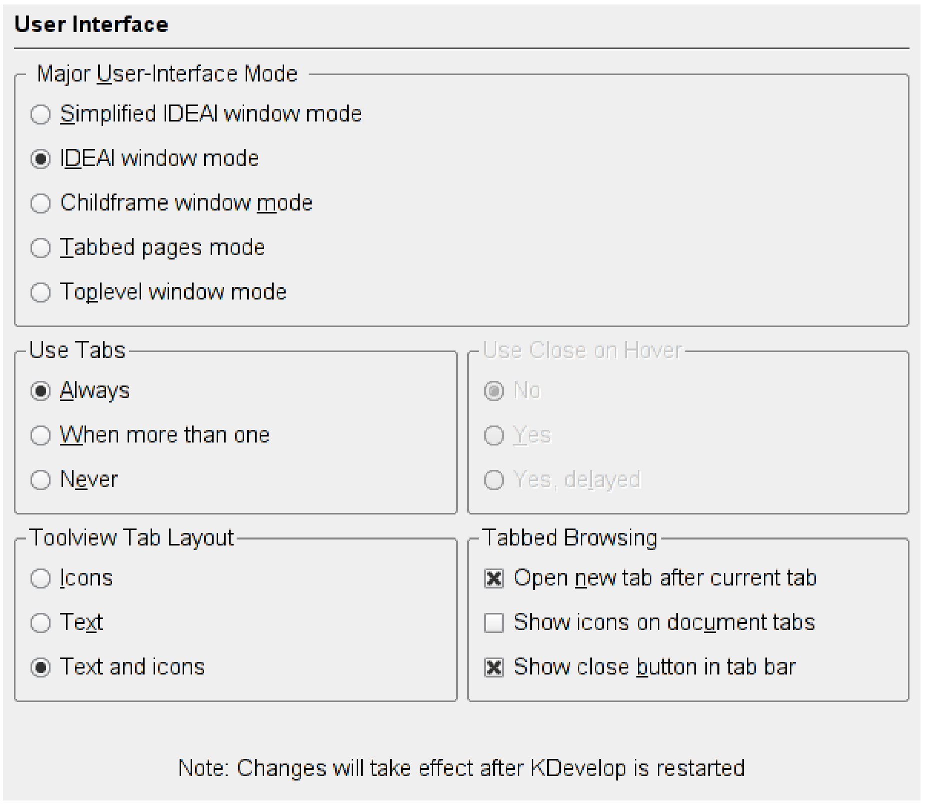
  This is a simplified version of the IDEA user interface. It is designed to be simple and clean. It also does not uses docked toolviews.

- IDEAl window mode
  This is a clone of the IDEA user interface, similar to the Tabbed pages mode and is default.
- Childframe window mode
  All tool views are initially docked to the mainframe. Editor and browser views will live like toplevel windows within a view area of the mainframe. A typical example of this user interface mode is MS Visual Studio 6.0.
- Tabbed pages mode

  All tool views are initially docked to the mainframe. Editor and browser views will be stacked in a tab window. A typical example of this user interface mode is KDEStudio, our friend C++-IDE in the world of KDE.
- Toplevel window mode

  All editor, browser and tool views will be toplevel windows (directly on desktop). The main widget contains the menu, toolbars and statusbar only. A typical example of this user interface mode is Borland Delphi 6.0.

To switch the user interface mode select Settings → Configure KDevelop... from the menus. The Customize KDevelop dialog will pop up, where you have to select User Interface in the left hand tree. This will display the following settings dialog to the right.



User Interface

Major User-Interface Mode
- Simplified IDEAl window mode
- [✓ IDEAl window mode]
- Childframe window mode
- Tabbed pages mode
- Toplevel window mode

Use Tabs
- [✓ Always]
- When more than one
- Never

Use Close on Hover
- [✓ No]
- Yes
- Yes, delayed

Toolview Tab Layout
- Icons
- Text
- [✓ Text and icons]

Tabbed Browsing
- [✓ Open new tab after current tab]
- Show icons on document tabs
- [✓ Show close button in tab bar]

Note: Changes will take effect after KDevelop is restarted

Select a user interface mode

Select the radio button of the user interface mode you want to switch to, then click OK.

NOTE
Do not forget to restart KDevelop in order to let any of these selections take effect.

When you selected either the Simplified IDEAl window mode or the IDEAl window mode or the Tabbed pages mode two more configuration sections will become available: Use Tabs and Use Close On Hover. These allow to configure under which circumstances tabs will be shown on top of the document windows and whether you may close the document by a click on the tab icon.

In Simplified IDEAl window mode and in IDEAl window mode only yet another configuration section will be available, Toolview Tab Layout which effectively allows to select between different sizes of the toolview tabs which surround the main working area in this mode.

Configuring the Documents Tab Bar Display In the IDEAl and tabbed pages modes there will be named tabs on top of the document windows by default, so you can easily select different documents with a left mouse button click. If you prefer to provide more space for the document windows in the KDevelop main work area, you may change to another behaviour in the Use Tabs configuration section.

Always This is the default — show a tab comprising an icon and the document name on top of any document window in the KDevelop main area display.

When more than one Do not show a tab when only one document is displayed. If there is more than one document, however, KDevelop will display an according tab bar as in the Always selection above. You may want to select this mode if you work on a single document most of the time as this provides more vertical space.

Never Never show any document selection tab. You may prefer this mode if you seldom use the mouse to switch between documents. It provides more vertical space for all document windows. To select another the document window or to close any, use the KDevelop Window menu.

Setting Up to Close a Document by a Click On Its Tab When you configured KDevelop to display the documents tab bar, either always or when more than one document is displayed in the main work area, you may add more functionality to the tabs beyond their document selection capability. Use the Use Close On Hover coniguration section for this.

No This is standard behaviour. No extra functionality is added to the tabs. They may be used only to select document windows on left mouse button clicks.

Yes When you selected this radio button, KDevelop will allow to close a document window by a left mouse button click. Use the mouse to point at the small icon on the on the left tab border. It will change to a close symbol. Now click with the left mouse button on this changed symbol and KDevelop will close the according document window.

Yes, Delayed After selecting this radio button, KDevelop will allow to close a document window as shown in the Yes case above. The icon will not change instantly, however, but there will be a short delay before the close icon shows up.

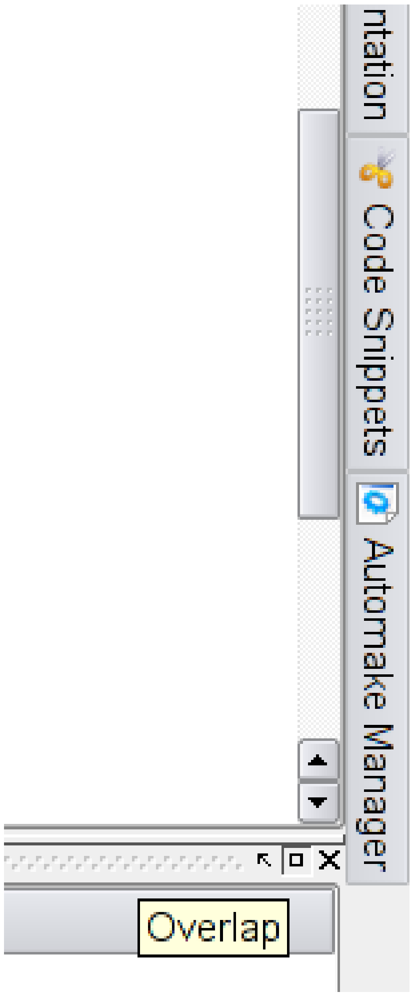
Configuring the Toolview Tab Layout The Toolview Tab Layout configuration section will be available in IDEAl mode only. Use these radio buttons to set up the look of the toolview tabs which surround the main working area in this mode.

Icons Each tab will show an icon only. If the associated toolview is displayed, the tab will open and a descriptive text for this toolview be shown. You may want to use this mode if you work on a monitor with limited resolution.
The icons are not very descriptive, however. If you want to find out which toolview is assigned to a given tab, point at it with the mouse and wait a second. A short tooltip will then pop up with the toolview name.

Text This is the default toolview tab display mode. Each tab displays the name of its associated toolwiew.

Text and Icons If the standard text toolview display looks too flat to you and you are working on a high-resolution monitor you may want to select this radio button. It will cause the name of the associated toolview be displayed on each tab plus an icon to the left of it, making the tabs easier to distinguish. See the Folded Toolview Tabs illustration below for an example.

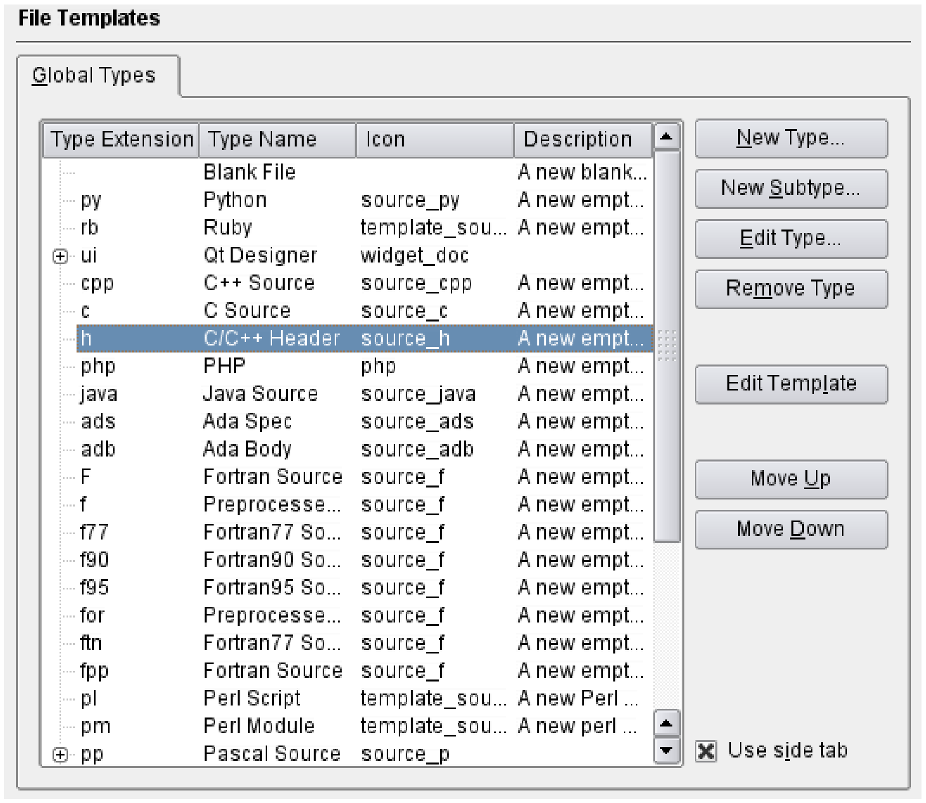
Folded Toolview Tabs If you selected the IDEAl mode toolview tabs to display texts (with or without accompanying icons) you need not worry about them being hidden behind some toolview window. If one of the bottom toolview windows occupies more space than is available to display all (vertical) tabs, they will fold around as this illustration shows:



Toolview tabs fold to not be hidden behind another view window

NOTE
The active toolview window must be shown fixed (non-overlap mode), sharing the work area with the other windows, to force such tab folding. Press the small square in the window border to accomplish this as shown in the example.

4.1.3 File Templates

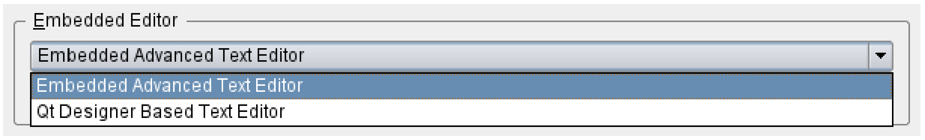


Type Extension	Type Name	Icon	Description
	Blank File		A new blank...
py	Python	source_py	A new empt...
rb	Ruby	template_sou...	A new empt...
ui	Qt Designer	widget_doc	
cpp	C++ Source	source_cpp	A new empt...
c	C Source	source_c	A new empt...
h	C/C++ Header	source_h	A new empt...
php	PHP	php	A new empt...
java	Java Source	source_java	A new empt...
ads	Ada Spec	source_ads	A new empt...
adb	Ada Body	source_adb	A new empt...
F	Fortran Source	source_f	A new empt...
f	Preprocesse...	source_f	A new empt...
f77	Fortran77 So...	source_f	A new empt...
f90	Fortran90 So...	source_f	A new empt...
f95	Fortran95 So...	source_f	A new empt...
for	Preprocesse...	source_f	A new empt...
ftn	Fortran77 So...	source_f	A new empt...
fpp	Fortran Source	source_f	A new empt...
pl	Perl Script	template_sou...	A new Perl ...
pm	Perl Module	template_sou...	A new perl ...
pp	Pascal Source	source_p	

Configure File Templates

4.1.4 Selecting an Editor

KDevelop allows you to select your favorite text editor tool. Mark the Editor entry in the left hand side selections tree of the Configure KDevelop window. The following dialog will be displayed to the right.


Embedded Editor
Embedded Advanced Text Editor
Embedded Advanced Text Editor
Qt Designer Based Text Editor

Select an editor

To select a new editor, click on the arrow on the drop down list field. Depending on the editor parts interfaces your KDE version has compiled in you will be provided with a list of editors you may select from (see the Important note below for this). Click on the editor of your liking and click OK. Currently there are two possibilities:

Embedded Advanced Text Editor This is the KDE standard Kate editor part.

Qt Designer Based Text Editor This is the editor Qt^{TM} provides in its Designer component.

These editor interfaces are fully integrated in the KDevelop IDE concept. Particularly the possibility to jump to the offending source code line by just clicking on an error message in the Messages Output View window has been provided.

NOTE
Changing the editor will not effect already open files. There are two possibilities to proceed. Either close all open text windows and reopen them one by one. Or simply close the whole project and reopen it again. The windows will then automatically open under the new text editor interface.

IMPORTANT
KDevelop lets you use editor interfaces which have registered with KDE and that provide a KatePart interface. If you miss one one of the selections shown above check your KDE installation if the corresponding KPart was correctly installed.

What to do if the file has been changed externally:

Do nothing The file will be marked as externally changed and the user will be asked to verify any attempt to overwrite it.

Alert the user A dialog will alert the user that a file has changed and offer the user to reload the file.

Automatically reload the file if safe, alert the user if not Any files that are not modified in memory are reloaded and an alert is shown for any conflicts.

4.1.5 Abbreviations for the Word Completion

(... to be written ...)

4.1.6 Scripting

(... to be written ...)

4.1.7 Adding KDE Standard Applications to the Tools Menu

(... to be written ...)

4.1.8 Adding External Applications to Menus

(... to be written ...)

4.1.8.1 Adding to the Tools Menu

(... to be written ...)

4.1.8.2 Adding to the File Context Menu

(... to be written ...)

4.1.8.3 Adding to the Directory Context Menu

(... to be written ...)

4.1.9 Selecting a Source Format Style

KDevelop automatically formats a source text in a predefined style. This style is highly configurable.

NOTE
The reformat source feature is currently available for C, C++, and Java^{TM} only. Especially you cannot use it for scripting languages like e.g. PHP. This is because KDevelop uses the astyle application to implement this feature.

To set up a specific format style, select Settings → Configure KDevelop.. from the menubar. The Customize KDevelop dialog will pop up, where you have to select Source Formatter in the left hand tree. This will display a series of three settings dialog tabs to the right, namely a General Formatting Setup, a Indentation Style Setup, and a Other Formatting Setup.

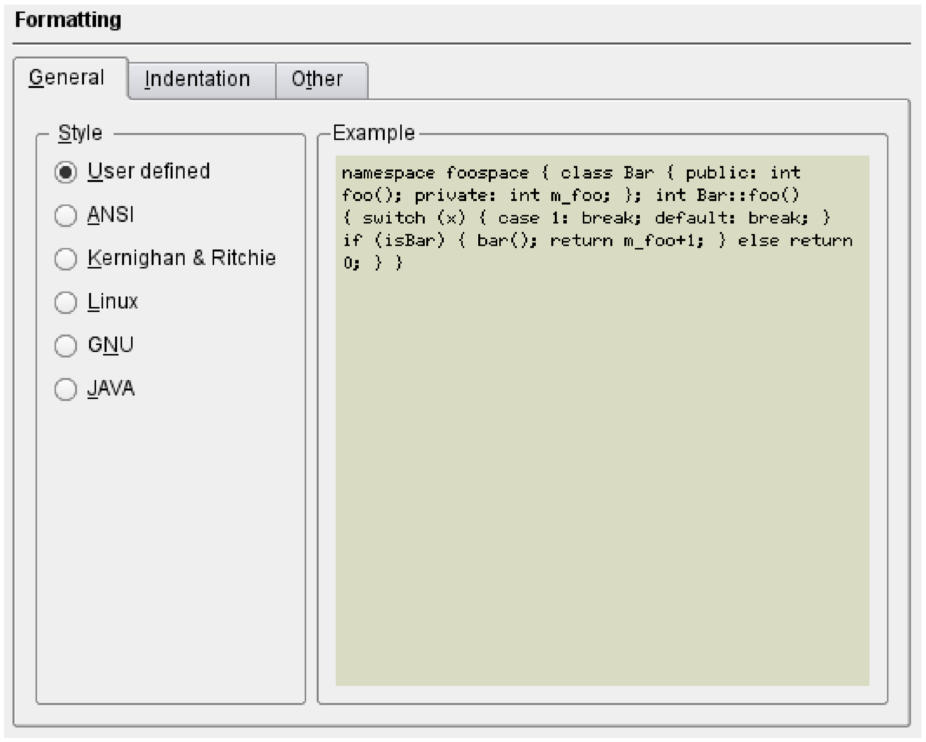
TIP
Any style changes apply to newly entered text only. If you want to change the formatting style of an already existing source text you will have to explicitely use the Edit → Reformat Source command.

NOTE
The exact outcome of these style formatting definitions depends on the editor you use. Currently, most settings are tailored to the Kate editor part (the 'Embedded Advanced Text Editor'). Some other editors (e.g. the Qt editor) may rely on their own configuration settings. You will have to experiment in this case to find out the exact effects of the style settings provided here.

WARNING
There may be incompatibilities between the configuration style settings provided here and the editor you use up to the extent that in extreme cases it even might destroy your files. Make sure you have a backup of your source files before you try out these settings with an none KDE standard editor.

4.1.9.1 General Formatting Setup

The General tab of the Source Formatter dialog allows you to select one out of five predefined source format styles.



(●) User defined
( ) ANSI
( ) Kernighan & Ritchie
( ) Linux
( ) GNU
( ) JAVA

```
namespace foospace { class Bar { public: int
foo(); private: int m_foo; }; int Bar::foo()
{ switch (x) { case 1: break; default: break; }
if (isBar) { bar(); return m_foo+1; } else return
0; } }
```

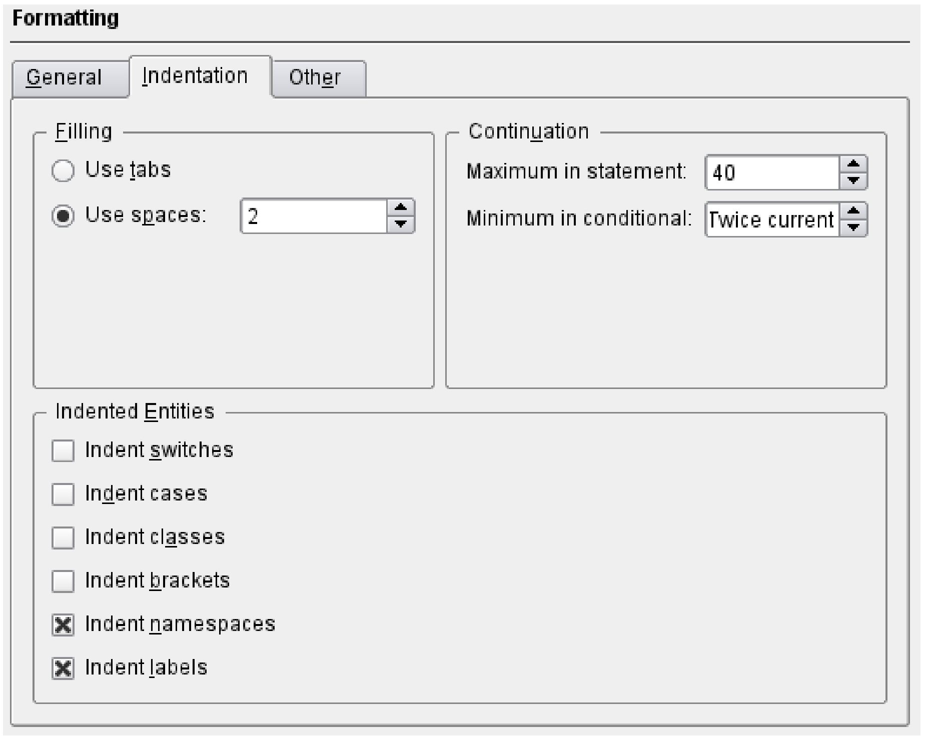
Source format style general setup

A formatted source example will be displayed in the field to the right. If none of the predefined styles is to your liking, you may click the top User defined radio button and define your own source formatting style preferences on the other two tabs which will become available then.

NOTE
Currently only the predefined source formatting styles will be demonstrated by an example text. If you decide to define your own style, no example display will be available. You have to experiment on an actual source text to tailor the settings to your liking.

4.1.9.2 Indentation Style Setup

Proper indentation is the main means to enhance readability of a source text. I you selected the Indentation tab of the Source Formatter dialog you will be presented with a series of indentation formatting choices grouped into three boxes as following.



Filling
- ○ Use tabs
- ● Use spaces: 2

Continuation
- Maximum in statement: 40
- Minimum in conditional: Twice current

Indented Entities
- ☐ Indent switches
- ☐ Indent cases
- ☐ Indent classes
- ☐ Indent brackets
- ☒ Indent namespaces
- ☒ Indent labels

Source format indentation style setup

Default Settings The preset format choices will cause the source text to resemble the ANSI formatting style:

```
namespace foospace
{
  int Foo()
  {
    if (isBar)
    {
      bar();
      return 1;
    }
    else
      return 0;
  }
}
```

Defining Indentation Width and Characters The radio buttons grouped in the Filling group define how indents in the source text will be drawn.

Use tabs This will cause the editor to insert a tab character for each indentation level. The tab width is predefined in the editor settings (8 or 4 character columns usually). Use Settings → Configure Editor... to redefine it.

> NOTE
> The actual tab width definition procedure depends on the editor you selected in the Selecting an Editor configuration step. You will have to look up the corresponding editor help to find out.

Use spaces If you select this radio button, the editor will enter a number of spaces for each indentation level. Change the number from the default 2 to the indentation width you prefer.

Indented Entities This defines which of the (C/C++) entities will be formatted with an extra indent beyond the current indentation level.

By default only namespaces and labels will be extra indented. You may want to experiment with various settings to tailor those extra indents to your liking.

Continuation The settings grouped here apply to those cases where the source formatter automatically wraps around long source lines. It takes two special cases in account, namely that in deeply nested indents there should remain enough room for the source and that conditionals should get extra indent levels on continuation to make them stand out properly.

> NOTE
> This applies to *static word wrap cases* only where a fixed maximum line width is used in the source text. If you set up your editor to dynamically wrap around long lines in display only (which is possible in the Kate editor part) the effects of these settings usually will not show.

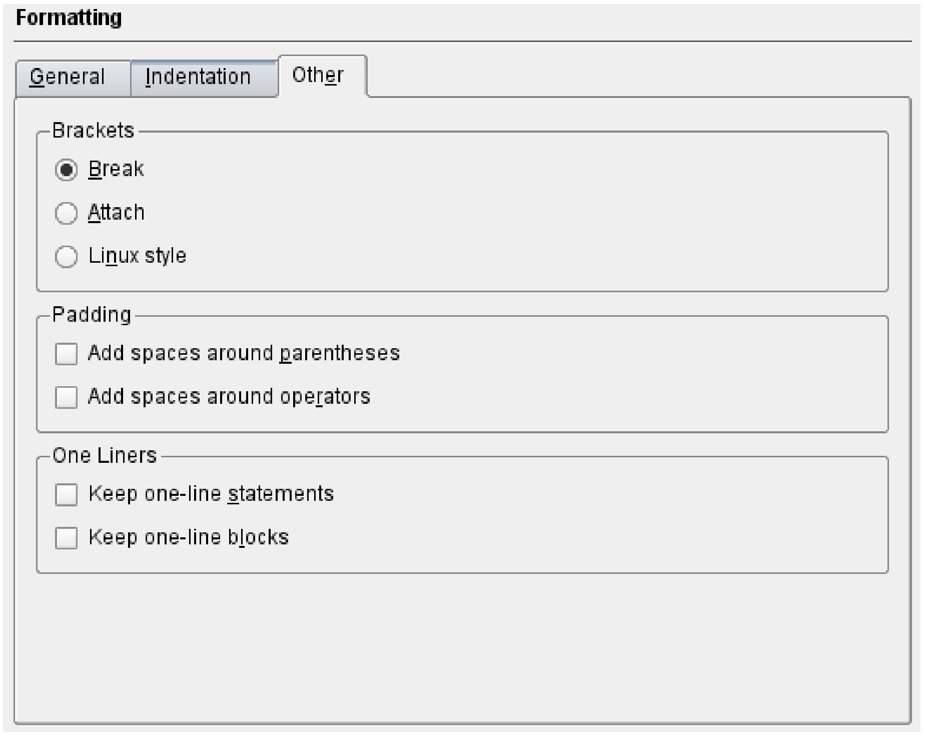
Maximum in statement This setting limits the maximum possible indentation for the continuation lines so that enough space will remain to keep the text readable. No continuation line will ever be indented beyond the number of columns you selected in this field.

The default is set to 40 character columns (half a standard 80 column page). You may want to increase this value to account for wider paper (e.g if you use landscape printing for your sources). Or decrease the value accordingly to take larger margin settings of your printouts into account.

Minimum in conditional Conditionals or source following e.g. an assignment operator should usually get an extra indent on continuation lines in order to keep the text readable. The amount of this extra indent is defined here.

The default is set to ‘Twice current’ which means that continued conditionals will get an extra indent level of the standard indentation size you selected in the Filling group. You may change this extra indent to another fixed width (including zero) using the arrows or by entering the value directly.

4.1.9.3 Other Formatting Setup


Formatting

General | Indentation | Other

Brackets
● Break
○ Attach
○ Linux style

Padding
☐ Add spaces around parentheses
☐ Add spaces around operators

One Liners
☐ Keep one-line statements
☐ Keep one-line blocks

Other source format style settings

Controlling the position of braces The radio buttons the (somewhat misnamed) Brackets group control the position of block delimiting braces in a (C/C++) source text. There are three possibilities from which you can select.

Break This inserts a line break before each opening brace. Both delimiting braces of any block will be put at the same indentation level as the block head statement.

```
namespace foospace
{
  int Foo()
  {
    if (isBar)
    {
      bar();
      return 1;
    }
    else
      return 0;
  }
}
```

Attach This will keep the opening brace of a block in line with the block head statement. Closing braces will be on the same indentation level as the block head statement. The else of an if statement will be kept in line with the closing brace of the preceding block.

```
namespace foospace {
  int Foo() {
    if (isBar) {
      bar();
      return 1;
    } else
      return 0;
  }
}
```

Linux Style This is a compromise of the above listed styles. Functional block delimiting braces will be put on extra lines. Braces opening a block in a conditional or loop statement will be kept in line.

```
namespace foospace
{
  int Foo()
  {
    if (isBar) {
      bar();
      return 1;
    } else
      return 0;
  }
}
```

Controlling Extra Spaces By default KDevelop does minimize the use of spaces in source texts.

```
if (isBar(fooArg)==barValue)
```

You may enhance readability if you force the source formatter to insert extra spaces in special positions.

Add spaces around parentheses In fact what is meant is to add spaces around the text put in parentheses. This enhances the readabilitiy of function arguments and conditionals.

```
if ( isBar( fooArg )==barValue )
```

Add spaces around operators This will put spaces around assignment and comparison operators to enhance the readability.

```
if (isBar(fooArg) == barValue)
```

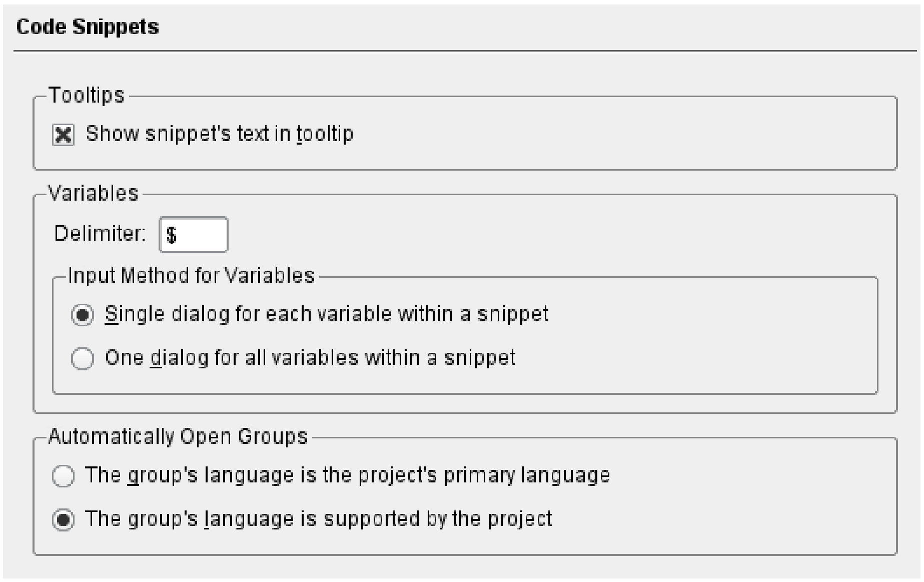
Controlling the formatting of one-line constructs There are a few cases where you don't want the source formatter to split a long line apart. For C/C++ code this can be controlled here.

Keep one-line statements This keeps single line statements together in some situations even if they exceed a fixed maximum line length.

Keep one-line blocks This keeps single line blocks together in some situations even if they exceed a fixed maximum line length.

4.1.10 Setting Up the Code Snippets Tool

When editing in KDevelop you can store often used parts of code as Code Snippets. To configure the capabilities of the code snippets part select Settings → Configure KDevelop.. from the menubar. The Customize KDevelop dialog will pop up, where you have to select Code Snippets in the left hand tree. This will show the following dialog in the right hand side.


Code Snippets

Tooltips
[✓] Show snippet's text in tooltip

Variables
Delimiter: $

Input Method for Variables
[●] Single dialog for each variable within a snippet
[ ] One dialog for all variables within a snippet

Automatically Open Groups
[ ] The group's language is the project's primary language
[●] The group's language is supported by the project

Configuring the Code Snippets tool

Activate Snippet Preview Mark the Show snippet's text in tooltip checkbox if you want to view the stored text in a tooltip window whenever you keep the mouse cursor over the title of that snippet.

Working with Snippet Variables The Code Snippets tool allows for a variable text in predefined places any time you insert a snippet into a file. To accomplish this Code Snippets provides its own variables' mechanism. You can set up it's behaviour in the Variables group.

Delimiter The Code Snippets tool distinguishes variables in the text by surrounding the variable name with special delimiter symbols. To use your own delimiter symbol, change the predefined $ character in the Delimiter field.

Input method for variables

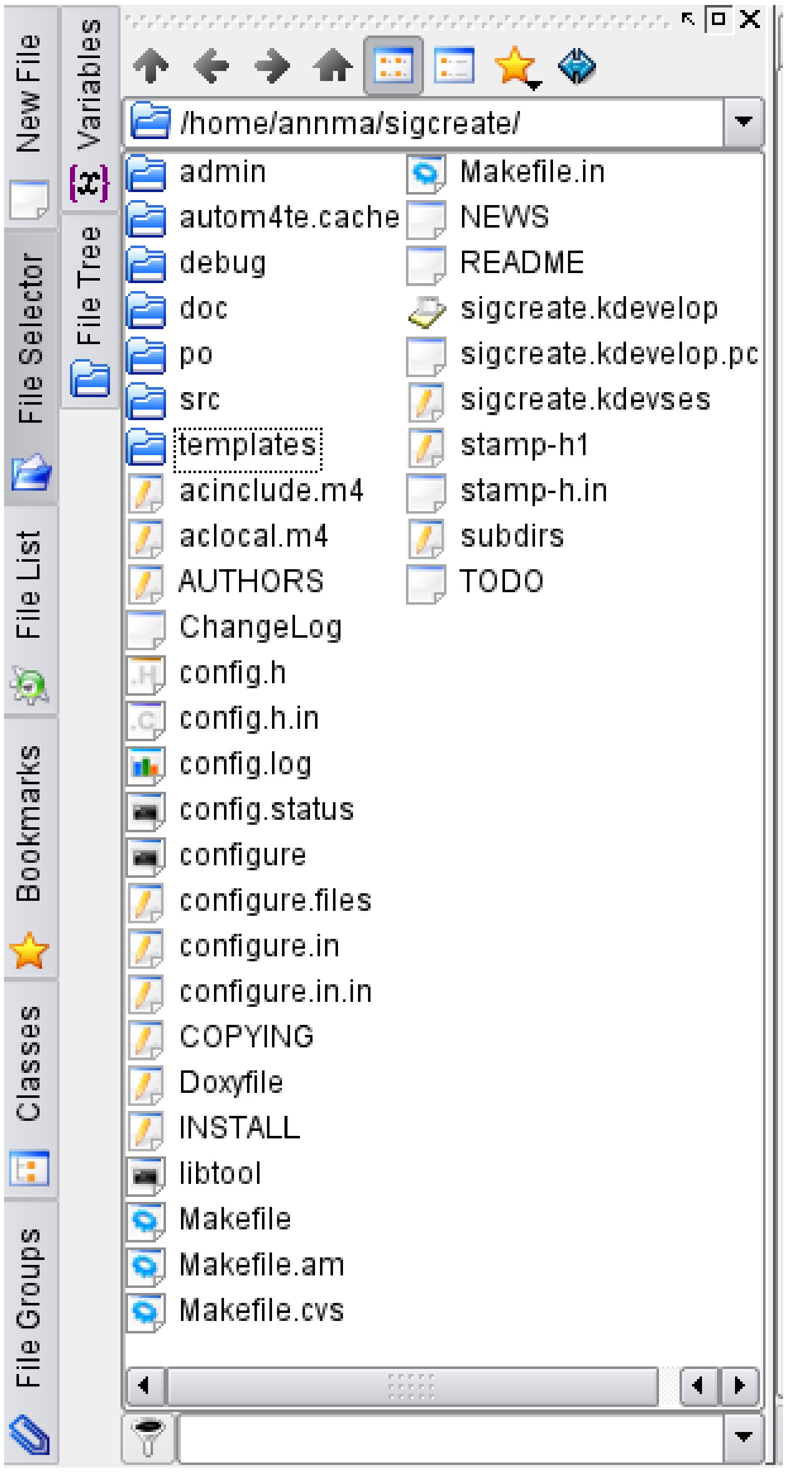
- Single dialog for each variable within a snippet – will in turn pop up a separate dialog for each variable which the tool finds when inserting the selected code snippet.
- One dialog for all variables within a snippet – will pop up a common dialog where the user has to fill in the values of all variables before the snippet will be inserted

4.1.11 File List

(... to be written ...)

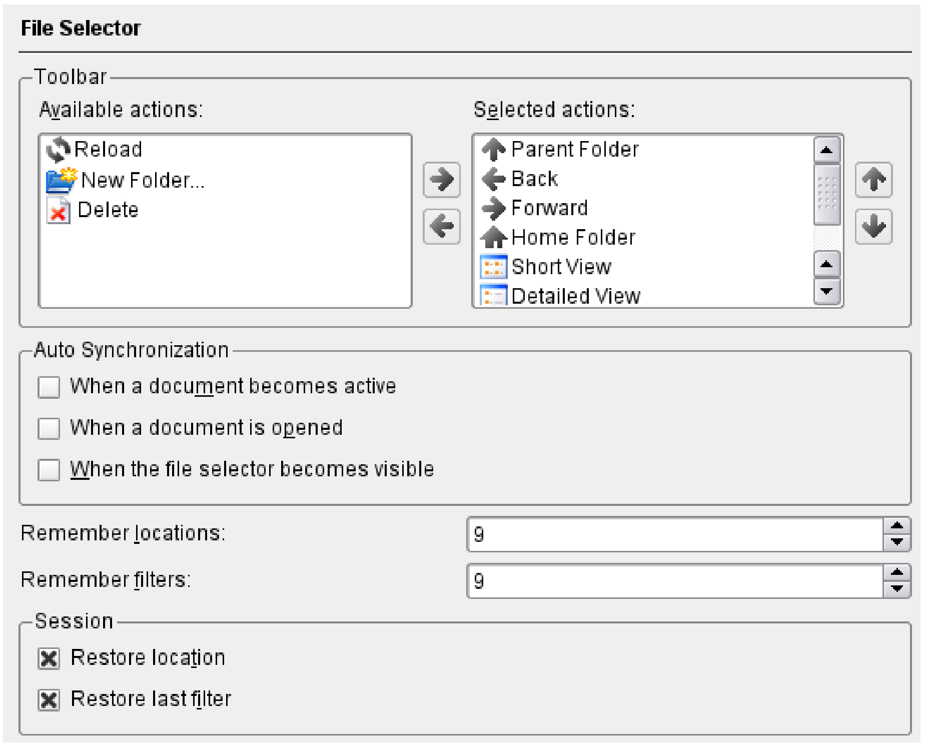
4.1.12 Configuring the File Selector

KDevelop provides a File Selector plugin which, when loaded at start-up, allows to navigate to any file or directory in the system.



The file selector (IDEAl mode)

The behaviour of the File Selector can be highly configured. Select Settings → Configure KDevelop.. from the menubar. The Customize KDevelop dialog will pop up, where you have to select File Selector in the left hand tree. This will show the following dialog in the right hand side.


File Selector

Toolbar

Available actions:
- Reload
- New Folder...
- Delete

Selected actions:
- Parent Folder
- Back
- Forward
- Home Folder
- Short View
- Detailed View

Auto Synchronization
- [ ] When a document becomes active
- [ ] When a document is opened
- [ ] When the file selector becomes visible

Remember locations: 9

Remember filters: 9

Session
- [x] Restore location
- [x] Restore last filter

Configuring the file selector

Configuring the Toolbar There is a toolbar on top of the File Selector which can be configured as usual in the Toolbar group.

1. Select an item in the right hand Selected actions list after which the new action should be inserted.
2. Select the action to be inserted in the left hand Available actions list.
3. Click the right (upper) arrow between both lists. The action will be removed from the Available actions list and inserted into the Selected actions list below the selected item.

1. Select the item to be removed in the right hand Selected actions list.
2. Click the left (lower) arrow between both lists. The selected item will be removed from the Selected actions list and put back into the Available actions list.

1. Select the action to be moved in the right hand Selected actions list.
2. Click the up or down arrow to the right of this list. The selected item will be moved up or down the Selected actions list.

Defining When the Contents Should Change Updating the contents in the File Selector window takes time and resources, esp. when changing to another directory. Therefore File Selector is set up by default in such a way that its contents change only on demand, i.e. when you select another directory or when you explicitely want to refresh its contents.

> NOTE
> Click the Reload button in the toolbar to update the contents of the File Selector. This toolbar button is not available by default, however. You must insert it there first.

You can configure the File Selector to immediately reflect certain changes in your work. The settings in the Auto Synchronization group of the configuration dialog are responsible for this.

When a document becomes active If you select this checkbox, the contents in the File Selector window will be updated whenever you go to another already open document, e.g. when you click on the tab of the according edit window in IDEAl mode. If necessary the File Selector will switch to the directory this file belongs to and update the display to show the actual contents in there.

When a document is opened If you select this checkbox, the contents in the File Selector window will be updated whenever a document will be opened, e.g. by the File → Open menu. If necessary the File Selector will switch to the directory this file belongs to and update the display to show the actual contents in there.

When the file selector becomes visible If you select this checkbox, the contents in the File Selector window will be updated whenever it gets visible again. If necessary it will switch to the directory the actual document belongs to and update the display to show the actual contents in there.

You may freely combine these settings to tailor the actualization behaviour of the File Selector to your liking.

Controlling the History in the Comboboxes There are two comboboxes on top and bottom of the File Selector contents window which control the directory to be displayed (top combobox) and the filters to be applied to the file display (bottom combobox). A history of the most recent settings is kept in the selection field of each combobox. You can configure the number of history entries as follows.

Remember locations Enter here the maximum number of directory selections the upper combobox shall remember.

Remember filters Enter here the maximum number of filter definitions the lower combobox shall remember.

Controlling What Should be Remembered Between Sessions By default the File Selector is set up so that it shows the display of the most recent session again at the next KDevelop start-up. You may change this behaviour in the Session configuration group.

NOTE
If KDevelop was automatically restarted by the KDE session manager the changes in these settings will have no effect. In this case location and filter settings of the most recent KDE session will always be restored.

Restore location Remove the checkbox mark here if you don't want the displayed location be remembered between sessions.

NOTE
If you selected one of the automatic update settings the displayed location might automatically change regardless what has been remembered from the recent session.

Restore filters Remove the checkbox mark here if you don't want the filters applied to the display be remembered between sessions.

4.1.13 C++ Class Generator

(... to be written ...)

4.1.14 Formatting

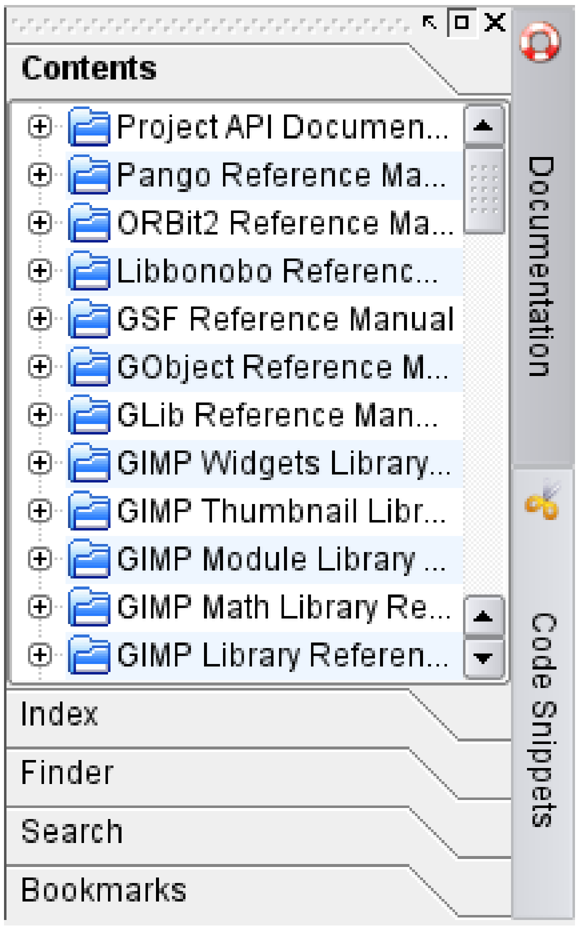
(... to be written ...)

4.1.15 C++ Parsing

(... to be written ...)

4.2 Configuring the Documentation

KDevelop contains a very powerful documentation facility which provides access to several kinds of extensive documentation. In e.g. IDEAl mode you find a Documentation tab at the right border of the work area.



The KDevelop documentation window (IDEAl mode)

NOTE
KDevelop must have loaded the Documentation plugin in order to view the documentation tree. See the Plugin Tools section for more info.

You may set up contents and behaviour of the various parts of this documentation window if you select Settings → Configure KDevelop.. from the menubar. The Customize KDevelop dialog will pop up, where you have to select Documentation in the left hand window.

The thus displayed configuration page shows three tabbed configuration dialog pages, namely:

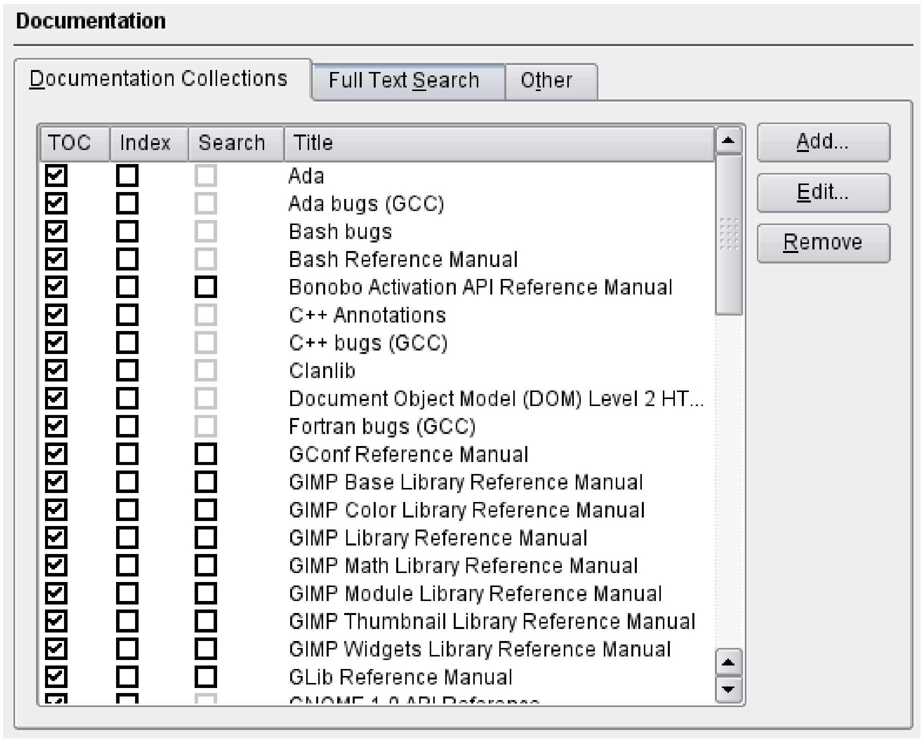
Documentation Collections
Full Text Search
Other

4.2.1 Setting Up Documentation Collections

The documentation configuration settings have been divided into a series of documentation collections, each providing access to documentation files of some unique format and content type. These setups control which documentation items will be listed on the Contents page of the KDevelop Documentation facility, and how the user may access documentation details by indexed and full text searches.

The Documentation tab provides a series of configuration pages which are ordered vertically like a stack of index cards. One page at a time will open after a click on its index card title:

- Qt Documentation Collection
- CHM Documentation Collection
- Doxygen Documentation Collection
- KDevelop TOC Documentation Collection
- Devhelp Documentation Collection
- Custom Documentation Collection



TOC	Index	Search	Title
☑	☐	☐	Ada
☑	☐	☐	Ada bugs (GCC)
☑	☐	☐	Bash bugs
☑	☐	☐	Bash Reference Manual
☑	☐	☐	Bonobo Activation API Reference Manual
☑	☐	☐	C++ Annotations
☑	☐	☐	C++ bugs (GCC)
☑	☐	☐	Clanlib
☑	☐	☐	Document Object Model (DOM) Level 2 HT...
☑	☐	☐	Fortran bugs (GCC)
☑	☐	☐	GConf Reference Manual
☑	☐	☐	GIMP Base Library Reference Manual
☑	☐	☐	GIMP Color Library Reference Manual
☑	☐	☐	GIMP Library Reference Manual
☑	☐	☐	GIMP Math Library Reference Manual
☑	☐	☐	GIMP Module Library Reference Manual
☑	☐	☐	GIMP Thumbnail Library Reference Manual
☑	☐	☐	GIMP Widgets Library Reference Manual
☑	☐	☐	GLib Reference Manual

Setting up documentation collections

4.2.1.1 Common Documentation Setup Structure

All configurations pages on the Documentation tab use a common layout. You will find the currently available documentation items of this type listed on the open page to the left and a set of buttons to the right.

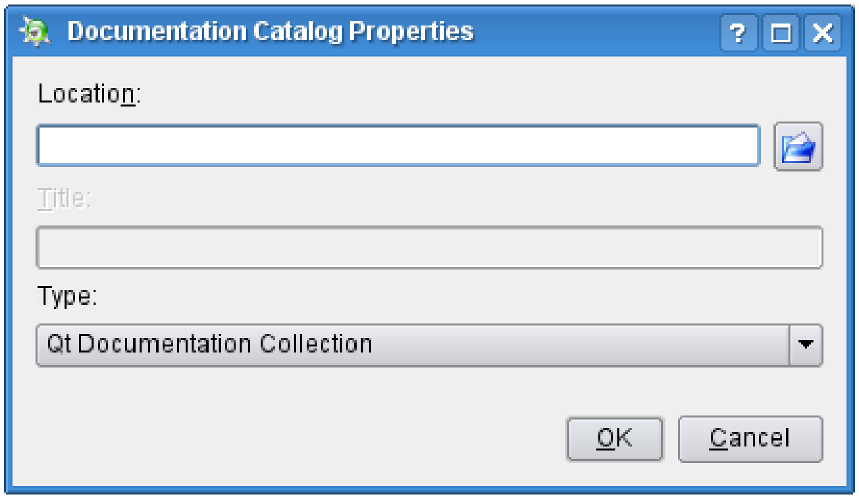
Buttons to Maintain Documentation List Contents There are three buttons available to maintain the contents of the documentation setup pages:

Add Opens a Documentation Catalog Properties dialog as shown below where you can select the source location of the documentation item to be added and name it.

Edit Opens a Documentation Catalog Properties dialog as shown below where you can change the source location of the documentation item previously selected in the list and rename it.

Remove Removes the selected documentation entry from the list.

> NOTE
> The entry will be removed from the list only. Actual documentation sources remain untouched. You will have to remove them explicitely by other means.



Add or change a documentation item

The button to the right of the Location field opens a directory dialog whose entries usually will be filtered according to the file type of the selected configuration page.

The Title field may not be accessible, depending on the documentation type to be maintained.

Documentation List Structure Every documentation setup page shows the listed documentation items in a table with four columns:

TOC If this check box is marked, this documentation item will show up on the Contents page of the KDevelop Documentation facility.

> NOTE
> Unchecking the TOC check box will in turn disable the Index and Search check boxes (see below). Thus you cannot have documentation collection items indexed but not shown in the contents.

Index If this check box is marked, an internal index will be built of this documentation item. This provides fast access to the documentation by the use of the Index and (optionally) Finder pages of the KDevelop Documentation facility.

> NOTE
> The internal index will be built the first time the user selects the Index page. This will delay the first access noticeably, because the index will be read from disk and then cached.
> All subsequent indexed searches will however use this chache and thus work significally faster.

Search If this check box is marked, the contents of this documentation item will be included in the full text search path of the Search page of the KDevelop Documentation facility.

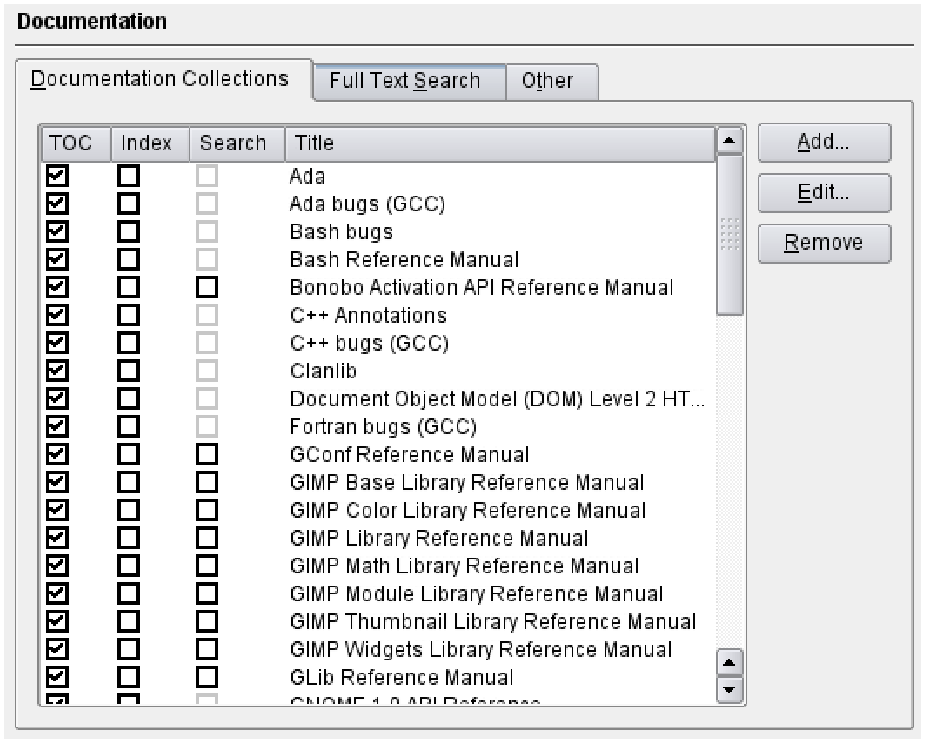
> NOTE
> KDevelop utilizes the htdig application collection to perform full text searches. This search is done over an internal index, the htdig machinery has to build before it can be used.
> Any change of the Search check box marks will thus effect the search runs only after you rebuilt the index on the Search page of the KDevelop Documentation facility.

Title This is the name of the Documentation item as it will be shown on the Contents page of the KDevelop Documentation facility.

> NOTE
> Former KDevelop versions allowed to select the documentation items to be displayed on a per-project basis. This is not available any more.

4.2.1.2 Qt^{TM} Documentation Collections

On this configuration page all Qt^{TM} documentation is set up.



TOC	Index	Search	Title
☑	☐	☐	Ada
☑	☐	☐	Ada bugs (GCC)
☑	☐	☐	Bash bugs
☑	☐	☐	Bash Reference Manual
☑	☐	☐	Bonobo Activation API Reference Manual
☑	☐	☐	C++ Annotations
☑	☐	☐	C++ bugs (GCC)
☑	☐	☐	Clanlib
☑	☐	☐	Document Object Model (DOM) Level 2 HT...
☑	☐	☐	Fortran bugs (GCC)
☑	☐	☐	GConf Reference Manual
☑	☐	☐	GIMP Base Library Reference Manual
☑	☐	☐	GIMP Color Library Reference Manual
☑	☐	☐	GIMP Library Reference Manual
☑	☐	☐	GIMP Math Library Reference Manual
☑	☐	☐	GIMP Module Library Reference Manual
☑	☐	☐	GIMP Thumbnail Library Reference Manual
☑	☐	☐	GIMP Widgets Library Reference Manual
☑	☐	☐	GLib Reference Manual

Setting up the Qt documentation collection

Normally KDevelop will fill this in on its first start-up. It looks for standard `*-.xml`, or `*.dcf` documentation files in the Qt™ installation directory. The table to the left lists the files KDevelop found by their standard titles.

If you have a non-standard installation, either there will be no information listed at all or the entries will possibly refer to improper locations (e.g. to another Qt™ installation available in your system). You may adjust the entries using the buttons to the right of the list field.

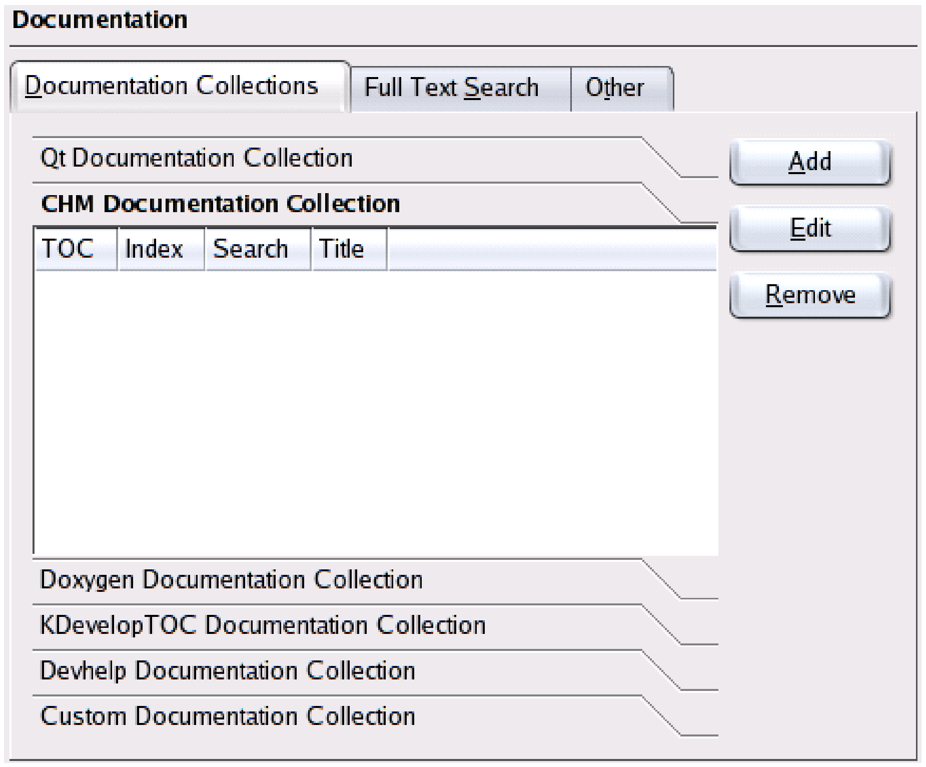
NOTE
KDevelop will use the titles already provided by the installed Qt™ documentation. Hence the Title field in the Documentation Catalog Properties dialog is inaccessible.

By default, not all Qt™ documentation will be shown on the Contents page of the KDevelop Documentation facility. Use the TOC check box in the setup table to select the documentation to be shown.

If you want to have some specific Qt™ documentation included in the search indexes or full text search use the Index and Searchcheck boxes in the setup table.

4.2.1.3 Setting Up the CHM Documentation Collection

On this configuration page you may collect documentation according to the Microsoft® CHM help file standard.


Documentation
Documentation Collections
Full Text Search
Other
Qt Documentation Collection
CHM Documentation Collection
TOC
Index
Search
Title
Doxygen Documentation Collection
KDevelopTOC Documentation Collection
Devhelp Documentation Collection
Custom Documentation Collection
Add
Edit
Remove

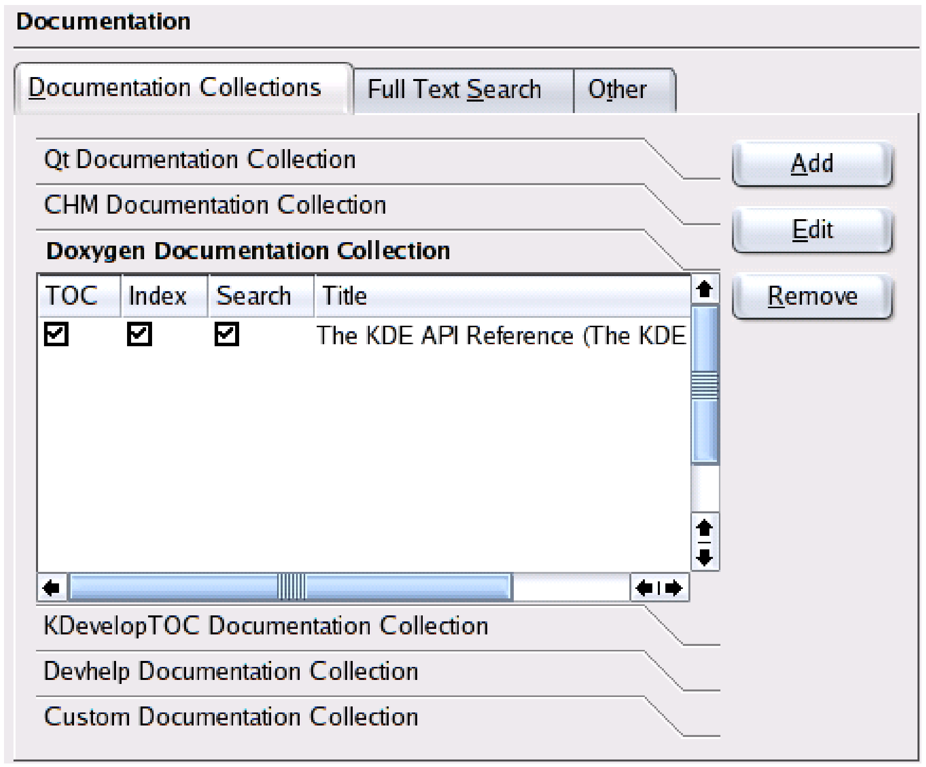
Setting up Microsoft CHM standard documentation files

By default, this configuration page will be empty (as shown above). You may add new entries using the buttons to the right of the list field. KDevelop will filter `*.chm` files in the directory dialog associated to the Add and Edit buttons.

For more information on the format of Microsoft® `*.chm` files see e.g. PHP: Documentation - Extended CHM Format at http://de2.php.net/docs-echm.php.

4.2.1.4 Documentation Generated by Doxygen

On this configuration page all API documentation generated by Doxygen is set up.


Documentation
Documentation Collections
Full Text Search
Other
Qt Documentation Collection
CHM Documentation Collection
Doxygen Documentation Collection
Add
Edit
Remove
KDevelopTOC Documentation Collection
Devhelp Documentation Collection
Custom Documentation Collection

TOC	Index	Search	Title
✓	✓	✓	The KDE API Reference (The KDE

Setting up Doxygen generated API documentation

In short, such an API documents the interface to certain library functions. The API documentation on this page should be produced by the externally provided Doxygen tool.

Doxygen generated API documentationconsists of a series of `html` files, starting with `index.html`. Additionally there may exist `tag` files which contain information to link to already existing API documentations. Thus KDevelop will look for `index.html` and `*.tag` files when seaching for Doxygen generated API documentation.

There are some structural constraints assumed when searching for Doxygen generated API documentation. The directory in which the `index.html` file resides should contain subdirectories with separate documentation collections. Each of these subdirectories is assumed to contain a `.tag` file and a `html/` subdirectory.

You may have a look at `$KDEDIR/share/doc/HTML/en/kdelibs-apidocs` for an example of such a Doxygen API documentation layout.

> NOTE
> The older KDE KDoc generated API format is not directly supported any more. If you still want to use such documentation, you may add it on the Custom Documentation Collection page.

KDevelop will have filled in a link to the current KDE Libraries API, provided it found one. There are several ways for KDevelop to find out:

- Either you provided the **configure** command with the `--with-kdelibsdoxy-dir` option when you compiled KDevelop (see the How to Obtain a KDevelop API Documentation chapter).
- Or the **configure** command did automatically find a Doxygen generated KDE Libraries API in one of several standard locations it knows of.
- Or as a last resort the `$KDEDIR/share/doc/HTML/en/kdelibs-apidocs/` was found at the first KDevelop startup.

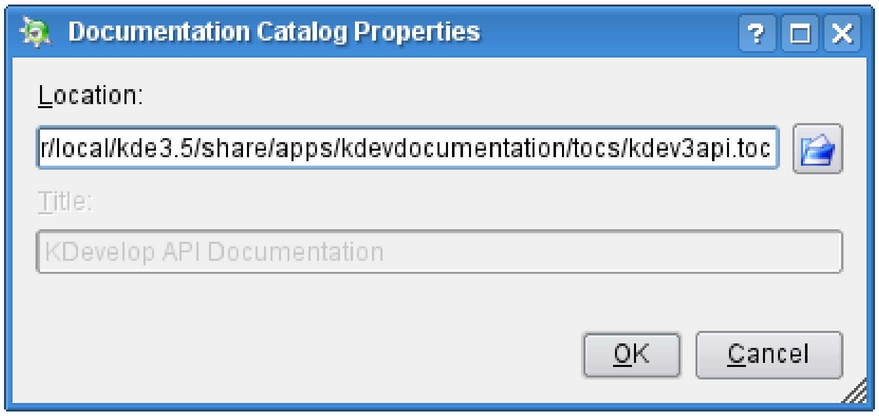
If KDevelop did not find a valid Doxygen generated KDE Libraries API at its first start-up the Doxygen Documentation Collection list will be empty.

You may add your own API documentation entries (e.g. from your current projects) by using the buttons to the right. If you want to have them included in the indexed and/or full text search mark the Index or Search check boxes in the setup table.

> NOTE
> KDevelop uses the title information from the `index.html`. Hence the Title field in the Documentation Catalog Properties dialog is inaccessible.

TIP

The KDE system provides more API documentation than the KDE Libraries API only. You will need additional interfaces information if you want to e.g. include the Kate part into you programs. For this Kate part API for example you should compile and install the KDE Base Libraries API from the sources (using the **make apidox** and **make install** commands on the `kdebase` sources) and then add an entry to the Doxygen Documentation Collection list like this:



r/local/kde3.5/share/apps/kdevdocumentation/tocs/kdev3api.toc

KDevelop API Documentation

Adding a KDE Base API to the list

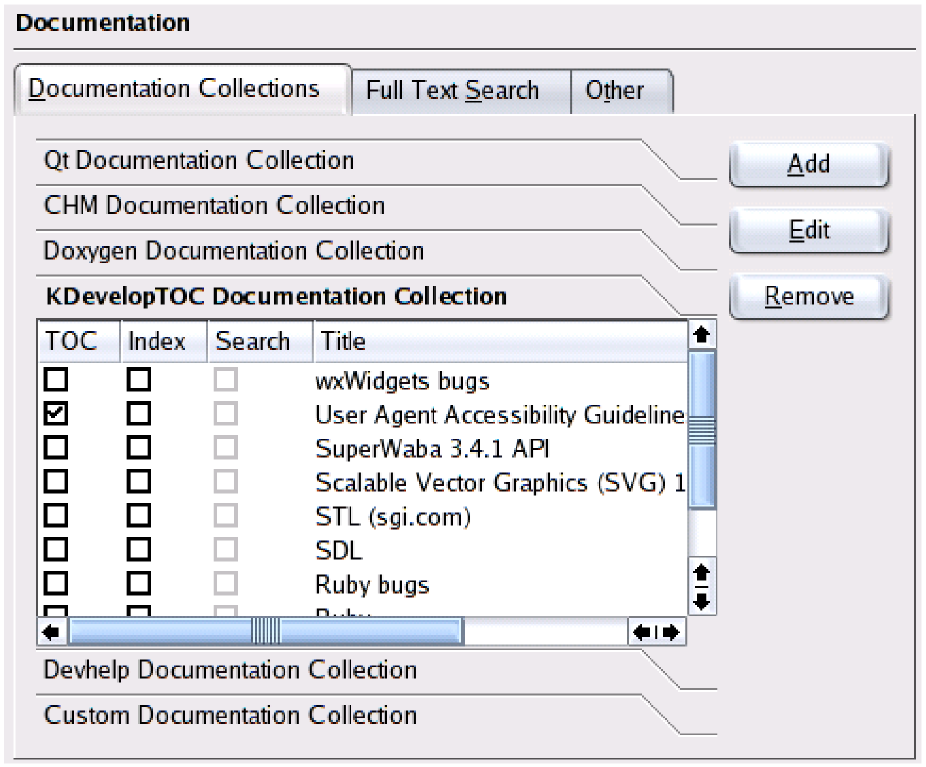
(Of course you should replace the `/home/dev/mykde-system/` directory in the Location field example with the path to your KDE installation.)

NOTE

You must put the API of your current project into this Doxygen Documentation Collection as well. Former KDevelop versions did put it into the documentation tree on a per-project basis. This is not provided any more.

4.2.1.5 Handling Structured Documentation (KDevelopTOC Files)

The main bulk of the KDevelop documentation facility provides immediate access to structured documentation, local as well as remote ones. You can configure this on the KDevelopTOC Documentation Collection page.


Documentation
Documentation Collections
Full Text Search
Other
Qt Documentation Collection
CHM Documentation Collection
Doxygen Documentation Collection
KDevelopTOC Documentation Collection
Devhelp Documentation Collection
Custom Documentation Collection
Add
Edit
Remove

TOC	Index	Search	Title
☐	☐	☐	wxWidgets bugs
☑	☐	☐	User Agent Accessibility Guideline
☐	☐	☐	SuperWaba 3.4.1 API
☐	☐	☐	Scalable Vector Graphics (SVG) 1
☐	☐	☐	STL (sgi.com)
☐	☐	☐	SDL
☐	☐	☐	Ruby bugs

Providing KDevelopTOC structured documentation access

KDevelop comes with a bunch of predefined KDevelopTOC files which are automatically entered in the table at installation time. To keep the display manageable only the most often used will initially be marked for display. If you want to see another documentation, mark the TOC check box in the setup table.

KDevelopTOC files cannot be indexed to perform a full text search because they usually point to a remote location. On the other hand, such a `.toc` file can have an index manually defined, using the `<index>` tag. Thus the Index check box will be enabled ony when KDevelop finds an `<index>` tag in the `.toc` file. (For more detail see the description below in the KDevelop TOC Files section.)

The Search check box in the setup table will alway be disabled.

You may add new entries using the buttons to the right of the list field. KDevelop will filter `*.toc` files in the directory dialog associated to the Add and Edit buttons.

NOTE
Other than former KDevelop versions will the Remove button not change the `*.toc` files on disk, so the remove operation is safe now.

4.2.1.6 KDevelop TOC Files

There is a special feature associated with this. To illustrate, follow these steps: In the documentation tree find an entry shortly below the Qt™/KDE documentation (e.g. ‘KDE2 Development Book (kde.org)’). Click on the plus sign next to it. A tree will open where you can quickly navigate to subsequent chapters nested several levels deep, all offline. But if you finally select one of the chapters, KDevelop will in many cases try to access a *remote* documentation file.

The rationale behind this is not only to locally navigate remote documentation without wasting net access ressources, but to provide the developer with easy, structured access to the documentation he/she needs. Using these tools one can access almost any local or remote documentation in a structured fashion even if the original is laid out flat or structured in another way. All that is needed is access to files and/or parts of files which are displayable by the Konqueror.

Such structured access is made possible through the use of special ‘table of content’ files, which are denoted by `.toc` filename extensions. Any such KDevelop TOC file contains an XML™ structured description of the document to be accessed.

Standard Directory of KDevelop TOC Files When KDevelop was installed usually a series of predefined `.toc` files has been put into the `$KDEDIR/share/apps/kdevdocumentation/tocs` directory. These are fairly simple, structured text files. You may look at them using a text editor or other text display facility.

BASIC STRUCTURE OF KDEVELOP TOC FILES

	`<!DOCTYPE kdeveloptoc>`
	`<kdeveloptoc>`
	(title)
header	*(base address)*
	(content structure)
	(index structure)
	`</kdeveloptoc>`

This XML™ structure will be parsed by the KDevelop Documentation plugin to set up the documentation tree contents and to guide the user in navigating the documentation. It contains all information necessary to display titles and access the documentation file contents.

title `<title>` *(some title string)* `</title>`

This is the title KDevelop will display at the basic levels in the documentation tree.

> NOTE
> This displayed title cannot be changed by the user. If you want another text be displayed, you must manually change the `<title>` entry in the `.toc` file.

base address `<base href="` *(base document URL)* `"/>`

This URL points to the location where all files of this documentation are located. It will be prepended before each section URL in the following content structure list. So, if you e.g. downloaded a documentation from a remote server, all you need to display the files from this new location is to change its `<base>` URL.

content structure
`<tocsect1 name="` *(section title)* `" url="` *(section URL)* `">`
...
`<tocsectn name="` *(section title)* `" url="` *(section URL)* `"/>`
...
`</tocsect1>`

All remaining navigation and access information is stored in a series of nested `<tocsecti>` ... `</tocsecti>` pairs. Each *i* denotes a consecutive nesting level down to number *n* which will correspond to the finally displayed documentation section.

Any `<tocsecti>` entry must have a `name="xxx"` attribute associated with it (the "xxx" denotes the actual title string). This name will be displayed as level title in the documentation tree. It should correspond to an actual documentation section.

There may be an `url=""` attribute associated with any *i* nesting level. When the user clicks on a section title in the documentation tree KDevelop will try to access the file at the location pointed to by the combined base and section URL.

The `<tocsectn/>` entry must have an `url=""` attribute whatsoever. This final nested `<tocsectn/>` does not come in pairs but will immediately be closed by a / before the > bracket.

> NOTE
> Any address combined of base and section URL must point to some displayable text file. Usually this will be an HTML-structured file. It is possible to link to anchor marks within such an HTML file using the standard # notation of the format: `/base-url/section-url#anchor-mark`.

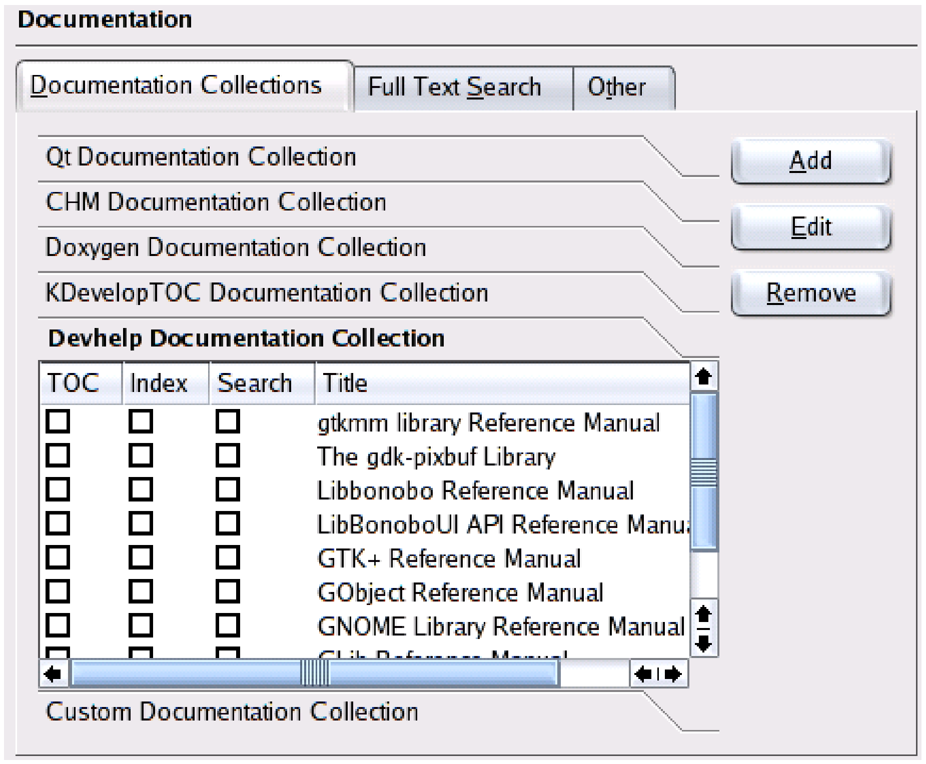
index structure
`<index>`
`<entry name="` *(index entry title)* `" url="` *(index section URL)* `"/>`
`</index>`

Index is a plain list of index entries - pairs of title and URL. Index is not mandatory.

4.2.1.7 DevHelp Documentation

DevHelp documentation is another means of structured documentation access. It uses structured table of content files denoted by a `.devhelp` extension similar to KDevelop TOC files to access documentation for the GNOME 2 desktop.

You can control which DevHelp files should be accessible on the DevHelp Documentation Collection configuration page.



Documentation

Documentation Collections | Full Text Search | Other

Qt Documentation Collection

CHM Documentation Collection

Doxygen Documentation Collection

KDevelopTOC Documentation Collection

Devhelp Documentation Collection

TOC	Index	Search	Title
☐	☐	☐	gtkmm library Reference Manual
☐	☐	☐	The gdk-pixbuf Library
☐	☐	☐	Libbonobo Reference Manual
☐	☐	☐	LibBonoboUI API Reference Manu
☐	☐	☐	GTK+ Reference Manual
☐	☐	☐	GObject Reference Manual
☐	☐	☐	GNOME Library Reference Manual

Custom Documentation Collection

Providing DevHelp documentation

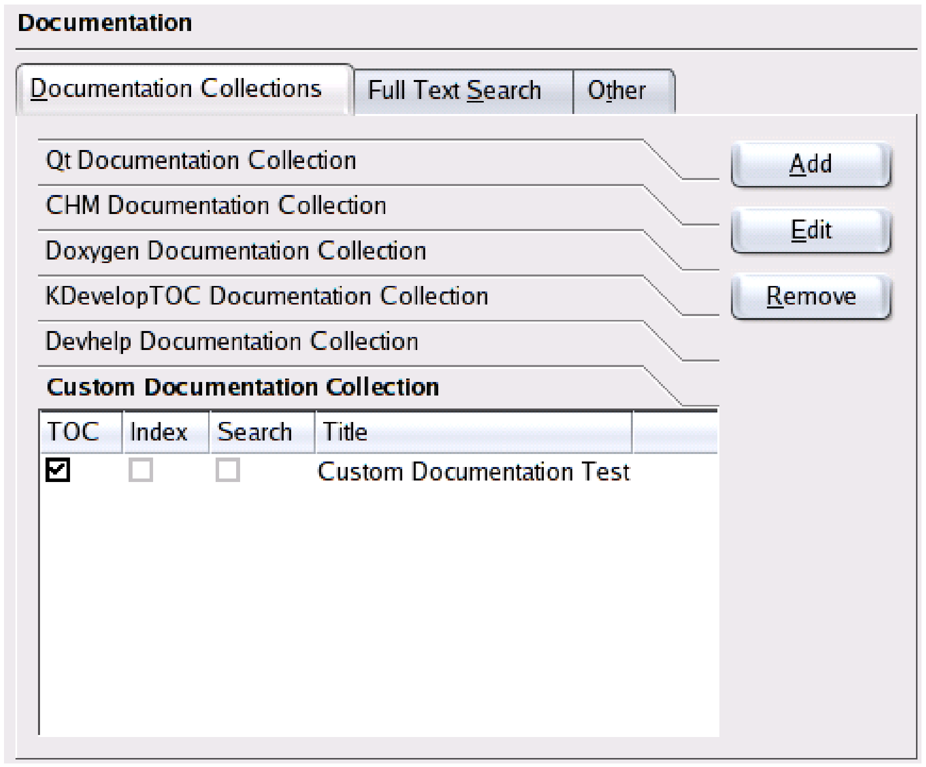
DevHelp files originally were accessible on the LiDN website, but this seems to be not maintained for some time now. More recent DevHelp documentation is available at the DevHelp Books Download web page.

When KDevelop is installed it will attempt to find all `.devhelp` files in some standard places in the system, e.g. in the subdirectories of `/opt/gnome/share/`. Initially these files will not be marked for display. If you want to see another documentation, mark the TOC check box in the setup table.

You may add new entries using the buttons to the right of the list field. KDevelop will filter `*.toc` files in the directory dialog associated to the Add and Edit buttons.

4.2.1.8 Setting Up Custom Documentation Collections

This is for your own purpose. You may add almost any documentation files here, provided they can be displayed by the Konqueror plugins.


Documentation
Documentation Collections
Full Text Search
Other
Qt Documentation Collection
CHM Documentation Collection
Doxygen Documentation Collection
KDevelopTOC Documentation Collection
Devhelp Documentation Collection
Custom Documentation Collection
Add
Edit
Remove

TOC	Index	Search	Title
☑	☐	☐	Custom Documentation Test

Providing custom documentation

Usually this collection will be empty at first KDevelop startup. We have filled in a deliberate item to show the entry structure.

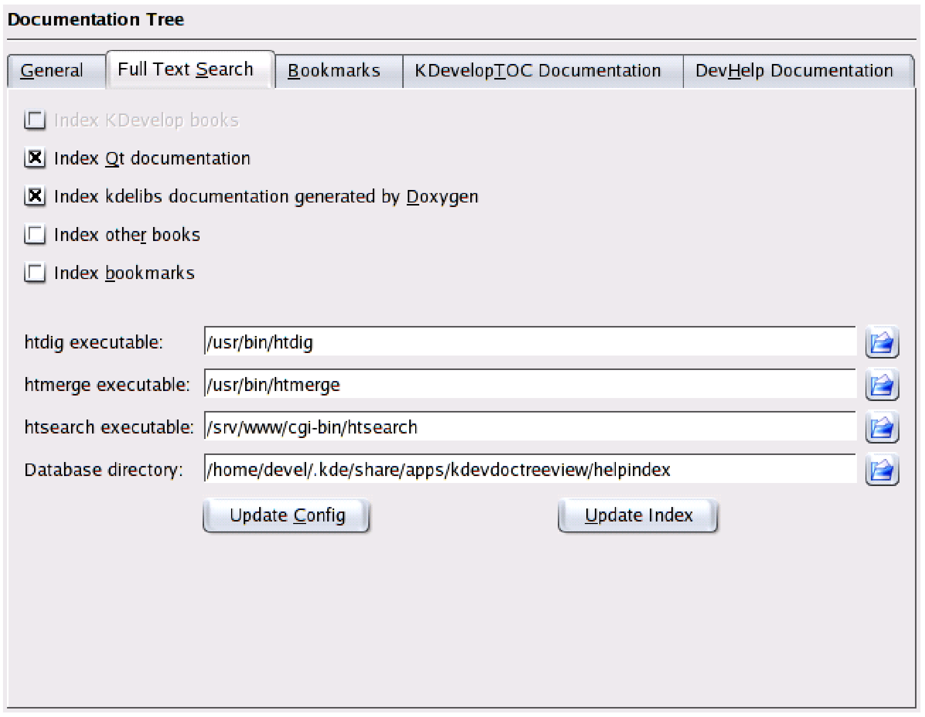
Handling is straightforward here. Use the buttons to the right of the list field to add, edit or remove the document items. KDevelop will not filter anything in the directory dialog associated to the Add and Edit buttons.

You will have to explicitely select the items for display in the KDevelop documentation facility. Mark the TOC check box of the entry in the setup table.

NOTE
Custom documention cannot be indexed or searched. Thus the Index and Search check boxes have no effect here as shown above.

4.2.2 Setting Up Text Search Indexes

(... to be written ...)



☐ Index KDevelop books
☒ Index Qt documentation
☒ Index kdelibs documentation generated by Doxygen
☐ Index other books
☐ Index bookmarks

htdig executable: /usr/bin/htdig
htmerge executable: /usr/bin/htmerge
htsearch executable: /srv/www/cgi-bin/htsearch
Database directory: /home/devel/.kde/share/apps/kdevdoctreeview/helpindex

Setting up text search indexes

4.2.3 Other Documentation Configuration Settings

(... to be written ...)

4.3 Advanced Configuration

(... to be written ...)

4.3.1 Plugin Tools

(... to be written ...)

Chapter 5

Getting Started — the Application Wizard

Bernd Pol In KDevelop software development work is organized in *projects*. Such a project keeps everything together which belongs to a complete programming task: source files, additional data files, any actually needed management facilities as the make system as well as access to all components and any additional tools needed to get the application up and running.

Organizing all development work in projects allows you to easily switch between the global tasks at hand. This is quite handy if you e.g. work on several applications at the same time as is often the case. Tell KDevelop to open the project you want to work at and you may proceed in the environment just where you left.

5.1 New Projects

Whenever you want to initiate a new programming project quite a lot of formal setup procedures need to be done. An initial directory structure has to be set up, initial header and source files must be provided, the make system has to be initialized, etc.

KDevelop provides an easy way to initiate a new programming project—the *Application Wizard*. You will find the Application Wizard at menu entry Project → New Project.

Only a short series of steps is necessary to start a new programming project, using the Application Wizard:

1. Select the programming language you want to use and the type of the application you want to build from a set of predefined templates.

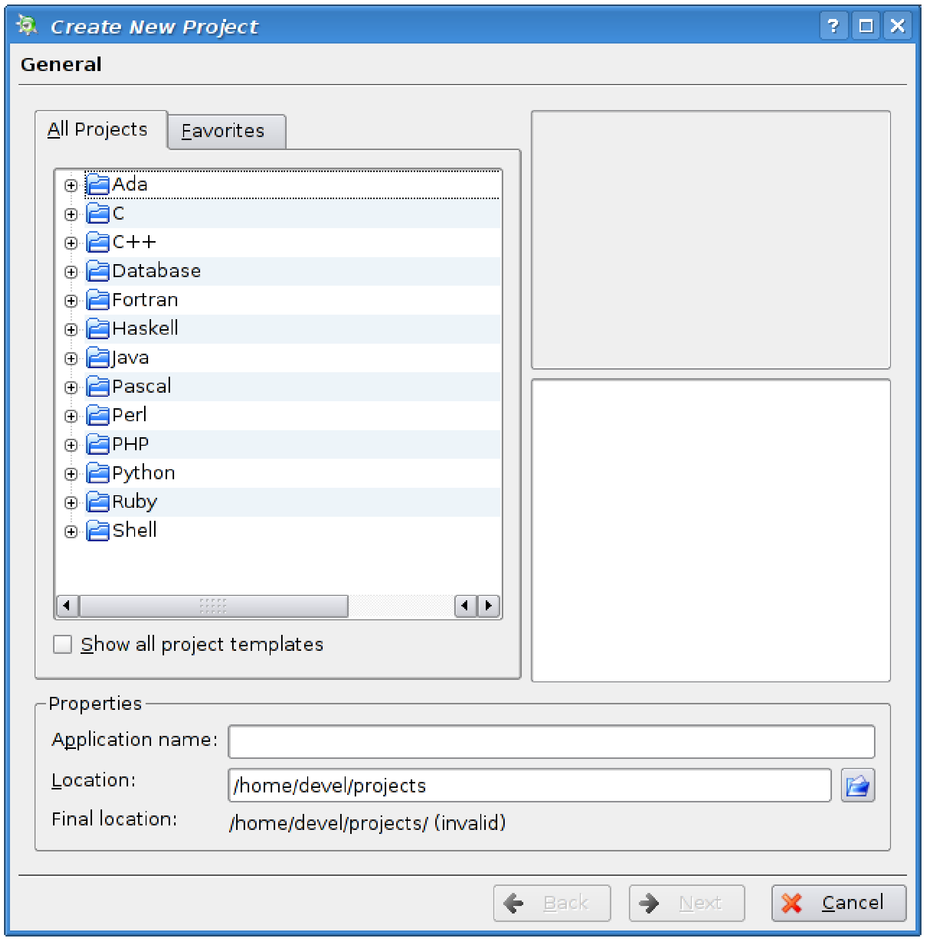
2. Supply some general information as application name, directory where the application shall be built, etc.
3. Decide whether you want to use a version control system, like e.g. CVS, and supply the necessary data if needed.
4. Set up some templates for initial header and source files (if applicable).
5. Finally tell Application Wizard to set up all initial stuff, directory structure, starting header/source file templates, and management tools, like e.g. an initial make skeleton, etc.

Voilà—that's all. Application Wizard will have provided you with a primary functional set of programming files, where you can readily start working.

Let's look at all this in more detail now ...

5.1.1 Initial Steps

To create a new project in KDevelop, select New Project from the Project menu. The Create New Project dialog will pop up showing an initial General page:



Initial dialog to set up a new project

As you see, this dialog is divided into an upper and a lower part. In the upper part you can decide on the programming language and application type, the lower part holds some general information.

5.1.1.1 Select Programming Language and Application Type

The left hand side of the upper part in this dialog is where you do the selection work. When it shows up, you'll find there a list of folders each labeled with a programming language, as there are:

- Ada
- C
- C++

- Database (SQL Projects)
- Fortran
- Haskell
- Java
- PHP
- Pascal
- Perl
- Python
- Ruby
- Shell (Scripts for the Bash Shell)

To be precise, these folders do not contain real programming tools actually. They do lead to pre-defined *templates* you can use as a starting point for development in that language. To get an idea of what is provided, just open the folders one after the other. There will be a series of subfolders on some, one or more simple entries only on others. The subfolders you see organize the available templates according to some tasks, the simple entries name the templates you may select.

We cannot go into detail here on which tasks each template provides, but it's easy to find out. Whenever you select a template entry some information is displayed in the fields to the right. In the lower field you will find a *short description* on what the template is supposed to do. In the field above that a picture will be shown, if available, about the outcome of the application this template produces if you compile and run it unmodified. Usually this is a *screenshot* of the main window the application will display.

Select the template which best fits your application's goals as a starting point. Then enter the general properties information in the lower field as shown in the next chapter.

Selecting a Project Management System Each template is bound to a specific Project Management System. Currently there is no direct means to freely select such a Project Management System. You have to find a template which suits your needs or alter your project accordingly after creation.

5.1.1.2 Provide General Information

The lower part of the Create New Project dialog General page is a framed field labeled Properties. You must provide some general information about your project here so that the Application Wizard knows how to build the initial structure.

Application Name Your application needs a name of course. Enter this in the uppermost Properties field, called Application Name. We use 'MyApp' as an example.

When you do so, you will notice that the Application Wizard refuses to accept special characters of any kind. The only characters accepted are:

- upper and lower case characters
- numbers
- the underline character

One prominent cause of this restriction is that the Application Wizard will use this application name as the *basis of some class names* it will construct when it sets up an initial project. Thus the name of the application must stick to the rules of the programming language you use.

The Project Directory The other prominent cause of this restriction you can see at the bottom line of the Properties area. It is labeled Final location and shows the directory where the Application Wizard will create the application.

As you type the application name you will notice that the Application Wizard repeats your input at the end of the Final location line, using lower case only characters.

Thus you must select the name of your new application with care. If you end up with an already used directory the Application Wizard will not allow you to continue to the next step, keeping the Next > button deactivated (grayed). Yet, it will *warn* you in this case by appending '(dir/file already exist)' to the Final location line.

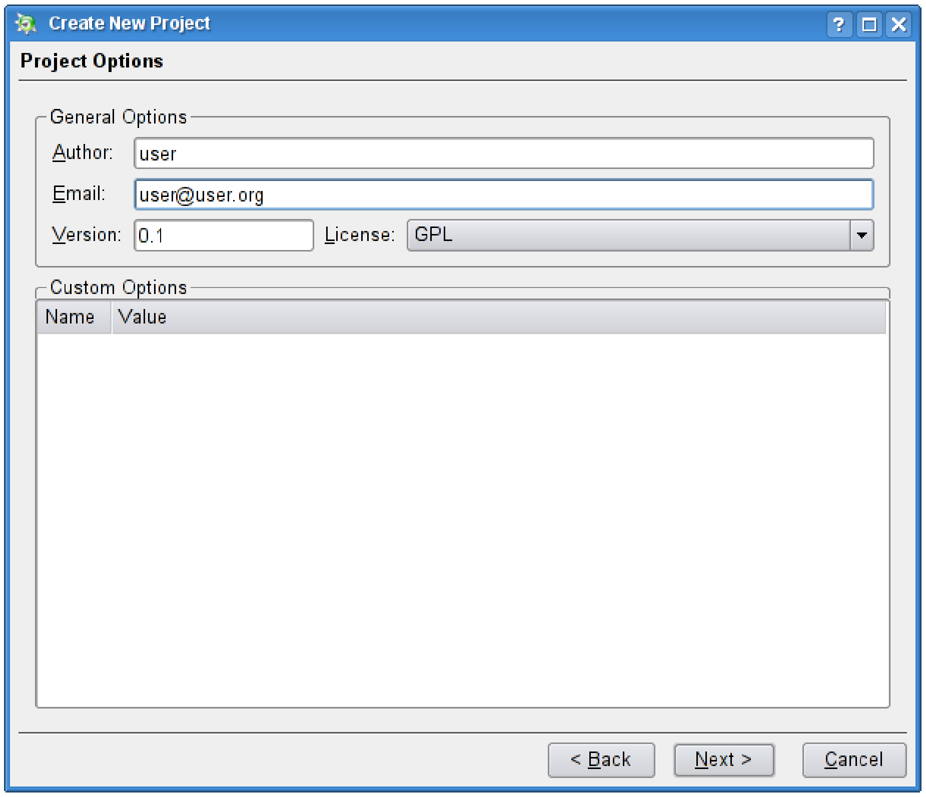
The Starting Path There are two ways to select another path for your new application. One is to select another name. Yet, this is not always feasible (you might e.g. set up for another version of an already existing application). As an alternative you may select another path to the application directory.

This is done in the second row input field of the Properties, named Location. What you enter here is the *starting path* of the new application development directory. The Application Wizard appends the application name to this path when it initializes the new project. The result is shown in the Final location line to give you better control on what is going on.

Application Wizard will copy an *initial value* to the Location field on start-up. This is taken from what you have chosen in the Default projects directory field during the general configuration steps. In our case we have KDevelop set up to use `/home/devel/projects/` as initial path for new projects.

Alter the Location field contents so that the application development directory shown in the Final location line will be unique.

NOTE
Take care that the path you enter in the Location field already exists. Otherwise you will not be able to continue to the next step. The Application Wizard will *warn* you about non-existing paths by appending '(invalid)' to the Final location line.


Create New Project

Project Options

General Options

Author: user

Email: user@user.org

Version: 0.1 License: GPL

Custom Options

Name	Value

Set new project up for CVS

Personal Information The fields following this are not so critical. Just supply your name (i.e. the name of the person who is responsible for the application) in the Author field, and a valid e-mail address in the Email field, so that users can give you feedback on the application.

NOTE

1. The Application Wizard fills these fields with some default values, taken from the Email presets in the KDE Control Center. If these defaults in the Create New Project Author and Email fields do not suit, you may want to have a look at your mail configuration in the KDE Control Center.
2. The Application Wizard will integrate this information into the starting program templates if applicable. In KDE C++ programs for instance you will find it near the beginning of the `main.cpp` source file.
3. Of all fields, the Email is *optional*, reflecting the fact that not every developer may have access to the internet. You may keep this field empty if you wish and proceed nevertheless.

Version and License Info Finally enter a starting version number for your new application in the Version field, and select the license under which you want your application be put from the License tab.

If you select an application type for which the Application Wizard provides common source template texts (e.g. C/C++), you may view the license notification text on the third page of this Create New Project dialog (see the Supply header/source templates chapter below).

If you selected 'Custom' from the License tab you must provide a license text on your own.

NOTE
Both version and license information will as well be integrated into the starting templates in a suiting format the application type you selected does provide.

Once you have correctly entered all this information stuff, press the Next > button to proceed as shown in the following chapters.

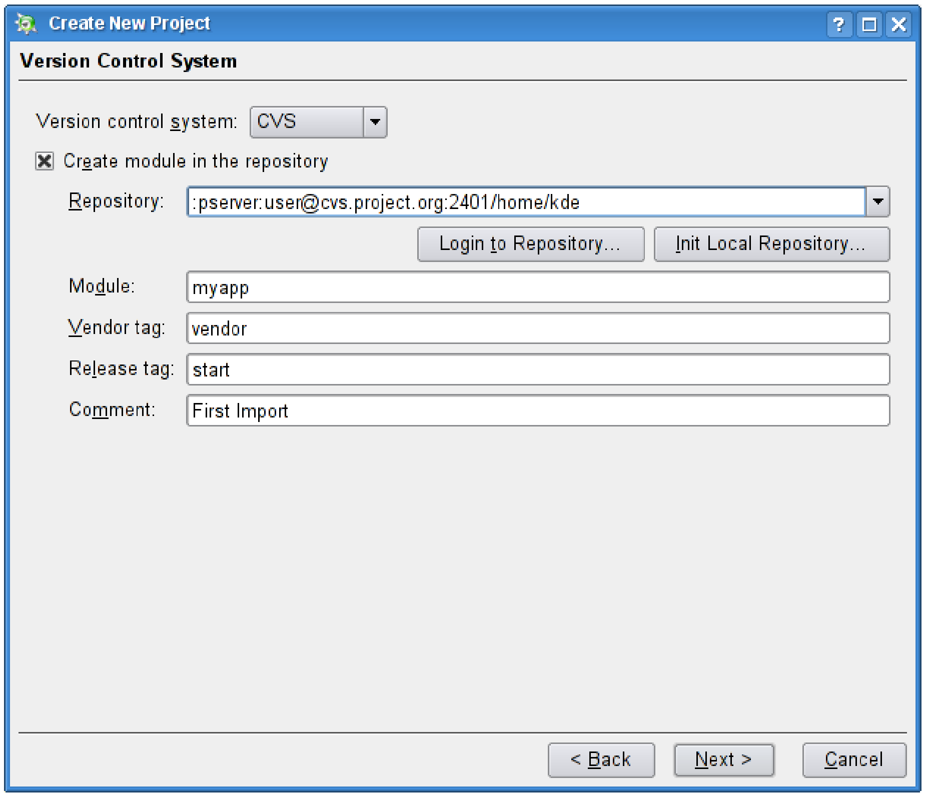
5.1.2 Supply Version System Information

In a second step the Application Wizard will lead you to the Version Control System page where you can decide which version control system you want to use.

NOTE
This discussion concentrates on the needs for project creation only. For more information on CVS see the Using CVS chapter below.

No Version Control System Wanted Initially there is 'None' selected in the Version control system tab, and the page will be empty otherwise. If you don't want to use a version control system, just click the Next > button and go on.

Using CVS Otherwise you must reselect the version control system you want to use from the Version control system tab. We use 'CVS' for our example. If you select this, the Application Wizard will redisplay the page, now showing a series of fields you must fill in.



Version control system: CVS

[✓] Create module in the repository

Repository:	:pserver:user@cvs.project.org:2401/home/kde
Module:	myapp
Vendor tag:	vendor
Release tag:	start
Comment:	First Import

Set new project up for CVS

A version control system such as CVS (which means 'Concurrent Versions System') stores copies of selected project files in some sort of a database. If you use CVS you can amongst others upload ('commit') those files or load them back into your project directory ('checkout', or 'update'). The special thing about this is that the files in the versioning database are stored in a structured way which allows you to always revert to an earlier development state if you need so. And CVS allows multiple designers to fairly easily collaborate on a big project (such as KDevelop) without disturbing each others work.

CVS Root CVS needs to *manage* the versioning database it keeps from your project files. To accomplish this it keeps some special database information in an own directory, called the *CVS root*. The first step on setting up CVS for your new project thus is to tell KDevelop where this root is located.

Local CVS root. There are two basic possibilities. Either you want to use a *local* CVS database or you use a database which is held on a *remote server*. If you develop for your own, you may want use the CVS database as some sort of a backup system on your own computer. Usually this is set up in your home directory root and given the name `cvsroot`. This may look as follows:

`/home/devel/cvsroot` (where `devel` simply denotes the 'developing' user, just for example)

> **NOTE**
> In fact, this is a short form. Exactly, the local CVS root should be addressed using the `:local:` prefix. The short form is only allowed in cases where the filename starts with a slash (/). The full name for our example local CVS root would exactly look like: `:local:/home/devel/cvsroot`

Enter the name of the CVS root directory your system has been set up for in the CVS root field. In principle you can select any name, even use multiple CVS databases, but it is advisable that you stick to the CVS root once set up.

Initialize a new CVS root. If there does not exist a CVS root yet, KDevelop can command the CVS system to create one for you in the given directory. Just check the Init root checkbox below the CVS root field.

> **NOTE**
> As said, KDevelop only *commands* the CVS system to initialize a new CVS root. It does nothing by itself to this directory. Fortunately CVS is clever enough to check whether the CVS root directory already exists. Hence it does no harm if you should have inadvertently checked Init root on an already existing CVS root directory.

Remote CVS root. There are occasions where the CVS database is to be kept on a remote server, especially when several developers work at the same project. Then you must enter the CVS root URL of this server in the CVS root field. For example, if you want access to the KDE CVS server:

`:pserver:`*`mylogin`*`@cvs.kde.org:/home/kde` (where *`mylogin`* denotes the login name set up in your KDE CVS account)

Remote CVS Server Types Basically there are two widely used remote CVS server types, the *pserver* which uses a password-secured non-encrypted protocol, and the *ext* server which uses an rsh or ssh encrypted data transfer. They are distinguished by the URL prefix they use:

`:pserver:`

for the 'password protected server' non-encrypted type, and

`:ext:`

for an rsh or ssh encrypted server type. For example

`:ext:`*`mylogin`*`@cvs.cervisia.sourceforge.net:/cvsroot/cervisia`

accesses the CVS root of the widely used Cervisia CVS management tool on the SourceForge server.

If you want to use an rsh or ssh encrypted server for CVS access you must tell KDevelop the encryption protocol to be used. Just enter `rsh` or `ssh` in the CVS_RSH field of the Create New Project Version Control System page.

NOTE
There is a caveat if you use an encrypted server for CVS from within KDevelop. See the Using CVS chapter for details.

The CVS Repository So far you have told KDevelop where the CVS root resides which manages the versioning database and how to access it. Now you need to tell KDevelop under which name you want CVS save your project files in that database. Such a place your project files will be held in CVS is called a *repository*.

In principle you can use any name for the CVS repository of your project files as long as it adheres to the specifications of naming a file. Yet, most developers simply use the name of the application itself. CVS will build a directory with this name in the CVS root, hence it is more easily found if you keep the application name for it.

Just enter the repository name you want to use in the CVS repository field of the Create New Project Version Control System page. In our example this is: `MyApp`

WARNING
Take care not to use a repository which already exists! The CVS system does not warn about duplicate files but will shovel everything in which does not produce a formal conflict. You will mess up everything!

The Remaining Fields There is not much work left to do. Application Wizard has already set up the remaining fields for you. In detail:

The Vendor field is used for compatibility reasons only. You can stick to the ‘vendor’ default the Application Wizard puts in here.

The Message field allows you to comment the initial CVS contents. Use any text you like or just stick to the ‘new project’ default the Application Wizard did put in.

The Release tag holds the name which tags the initial state of your project. Such a *tag* names a certain point within the CVS repository by which you can later access this state of your development. (See more in the Using CVS chapter.)

The Application Wizard has put a default ‘start’ tag in here which is a worthy proposal. Just stick to it.

NOTE
When any information of all these is wrong KDevelop usually will not know about until project construction time. It is the CVS system which will figure out those errors when it tries to build the repository. Hence you must keep an eye to the Messages window of KDevelop when the project is created in the final setup step. If anything was in error with CVS you will in most cases see an error message like this:

```
* cd '/home/devel/test' && cvs -d '/home/devel/mycvsroot' ↩
     \
  import -m 'new project' '' 'vendor' 'start' &&\
  sh /opt/kde3/share/apps/kdevcvs/buildcvs.sh . '' \
  '/home/devel/mycvsroot'
* cvs [import aborted]: /home/devel/mycvsroot/CVSROOT: No ↩
     such file or
  directory
* *** Exited with status: 1 ***
```

If this happens you will have to either manually set up CVS (KDevelop should have successfully initialized your project files at this time) or delete the project directory and start over again with New Project from the Project menu.

After you have entered all CVS related information, click the Next > to go on.

NOTE
If you want to correct an error on the previous Create New Project page, just press the < Back button. The Application Wizard will remember your settings on the current page, so you can easily proceed when you come back.

5.1.3 Supply Header/Source Templates

The next step brings you to a series of pages where you can set up common information you want to include in your source and header files, if the task at hand allows.

Both header and source templates are provided for C and C++ applications, each on its own page. For other languages there may be source templates only. And in some cases you will even find this template page empty.

If the page is used, Application Wizard will fill in some common header comment which for a C++ based application might look like:

```
/*************************************************************************** ↩

 *   Copyright (C) 2003 by Your Name  ↩
                                                  *
 *   you@you.com  ↩
                                                                 ↩
     *
 *  ↩
                                                                                  ↩
    *
 *   This program is free software; you can redistribute it  ↩
    and/or modify  *
 *   it under the terms of the GNU General Public License as  ↩
    published by  *
 *   the Free Software Foundation; either version 2 of the  ↩
    License, or     *
 *   (at your option) any later version.  ↩
                                 *
 *  ↩
                                                                                  ↩
    *
 *   This program is distributed in the hope that it will be  ↩
    useful,       *
 *   but WITHOUT ANY WARRANTY; without even the implied  ↩
    warranty of        *
 *   MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.   ↩
    See the         *
 *   GNU General Public License for more details.  ↩
                          *
 *  ↩
                                                                                  ↩
    *
 *   You should have received a copy of the GNU General  ↩
    Public License     *
 *   along with this program; if not, write to the  ↩
                         *
 *   Free Software Foundation, Inc.,  ↩
                                   *
 *   59 Temple Place - Suite 330, Boston, MA  02111-1307, USA ↩
    .             *
 ***************************************************************************/ ↩
```

Other templates will provide similar information in a format according to the definitions of the programming language you want to use.

As you might have noticed, the applications manager did readily fill in some information you provided on the first General page of the Create New Project dialog, namely the contents of the Author and Email fields. Also proper license information will have been inserted according to your selection in the License tab.

5.1.3.1 How to Edit the Templates

The templates you set up in the Create New Project dialog will later be processed whenever you command KDevelop to set up a new source and/or header file. The information you provided here will be included at top as a documentation header, before the code parts begin.

You are not restricted to plain text however. KDevelop knows of several variables which allow you to include actual information in the file. The Application Wizard did in fact use some such variables to insert the Author, Email, and License informations into the initial template text.

Include Doxygen File Information If, for example, you want the Doxygen-built API documentation to display some further information about the file's contents in its filenames list, you may include the following lines in the source file template:

```
/**
 * \file $MODULE$.cpp
 * \brief (put some short descripion here).
 **/
```

Whenever you create a new source file, KDevelop will replace the `$MODULE$` variable by the name body of the newly created file. For example, if you created a new C++ class named `ASimpleTest` you will see the following lines in the `asimpletest.cpp` file:

```
/**
 * \file asimpletest.cpp
 * \brief (put some short descripion here).
 **/
```

You will still have to provide the short description after the '\brief' keyword, but part of the job is automatically done for you.

The License Text File As another example you could include an explicit hint to the license text you want to use into the template. Use the `$LICENSEFILE$` variable for this and add for example this line:

```
//   See $LICENSEFILE$ for the full license text.
```

The Application Wizard will replace the `$LICENSEFILE$` with the name of the file where the full license text is to be found, namely:

```
//   See COPYING for the full license text.
```

for the GPL license, or

```
//   See LICENSE.BSD for the full license text.
```

if you decided to put your application under the BSD license.

Thee are of course more variables KDevelop knows of. See the Editing the templates section in the Editing tools chapter for what is possible.

NOTE
The templates you define here will come in effect only after the Application Wizard has created the new project. You will find this information on top of the files you created yourself in the development process. When creating the initial files the Application Wizard will use some predefined standard templates. You will have to manually adapt those initial files to your needs.

5.1.4 Build the Initial Project Files

Almost everything is done now. On the last templates page the Next > button will have changed to read Finish now.

Think twice before you click on it! You still have the option to revise everything by repeatedly using the < Back button. As the Application Wizard remembers all information you did input so far, it may be advisable for you to take the time and look back once again. In case you use local CVS, do not forget to double-check the *CVS repository* name (there should be no subdirectory with that name in the CVS root directory already—if it does, try another repository name).

If ever you don't want the new project be built, abort the Create New Project dialog by the Cancel button. Otherwise click Finish and watch in the Messages window how the Application Wizard initiates the project.

If you want to use a versioning system (CVS) there will be two runs actually. Application Wizard will first build the project directories and files and then call up the CVS program which restarts the Messages window with its own contents. If any error occurs in either of these runs, the process will stop showing you an according error message in the window.

NOTE
In many cases when your new project has been set up this way, KDevelop will automatically load the source file(s) of one or more basically important modules so you can readily start work. (Which source modules will be displayed—if any at all—however depends on the template initially selected in the Application Wizard.)

Do not forget to initially check what the Application Wizard has provided. For example you may want to change the initial heading informations according to your own templates. Usually you will find these in a `templates` subdirectory in your project directory. Some simple copy operations will mostly suffice.

Then it is advisable that you *compile the initial project* before you attempt to change any code. In most cases this initial compilation should be possible. Thus you can make up whether the project really was set up according to your needs. If it was not, simply remove the project directory (in your local CVS root as well if you use one) and start over again.

WARNING
Before you compile your new project the first time, have a look at Project → Build Configuration. If there are three selections displayed: default, optimized, and debug, with debug selected, by all means stick to this, or use optimized instead.
Due to some limitations in the current autoconf/automake setup you should *by no means* build in the default configuration. This will corrupt some internal directory settings, thus making **configure** complain when you try to use it in the optimized, or debug build configuration afterwards.
(This applies to these multiselection capabilities only. If the application type you selected provides a default build configuration only, you should of course use this one.)

5.2 Configuring Projects

(... to be written ...)

Chapter 6

Editing Tools

6.1 Code Snippets

FEATURES (PRELIMINARY OVERVIEW)

- SnippetPart adds a tool-view which by default docks to the right
- Adding, editing and removing of snippets is available via a popup-menu
- Double-clicking a snippet form the list inserts it into to the active view at the current cursor position
- Tool tips show the content of a snippet
- Snippets are stored in the users home-directory, so every user can have his own snippets
- Snippets can contain variables in the style of $`VARNAME`$. On using the snippet the user is prompted to enter replacement value for the variables

6.2 Keyboard Mapping

In the following, we will list the default keybindings of the default editor. You can configure them as you like (how?)

Left	Moves one character left
Right	Moves one character right
Ctrl- Left	Moves one word left
Ctrl- Right	Moves one word right
Up	Moves up one line

Down	Moves down one line
Page Up	Moves up one page
Page Down	Moves down one page
Ctrl- Page Down	Moves to the beginning of the file
Ctrl- Page Down	Moves to the end of the file
Home	Moves to the beginning of the line
End	Moves to the end of the line

For all the keys above, the **Shift** key can be pressed additionally, to mark from the current cursor position to the one afterwards.

Backspace	Deletes one character left
Delete	Deletes the character under the cursor
Ctrl- C	Copies the selected text to the clipboard
Ctrl- V	Pastes the selected text from the clipboard
Ctrl- X	Deletes the selected text and puts it into the clipboard
Ctrl- Z	Undo
Shift-Ctrl- Z	Redo

6.3 The Problem Reporter

(... to be written ...)

6.4 Searching and Grepping

6.4.1 Searching for Text

Ctrl-F- Find Ctrl-R- Replace

6.4.2 ISearch

The conventional search with Edit → Find requires you to specify the full search term before starting. Most of the time, it is much faster to search incrementally.

If you click into the edit field labeled ISearch in the toolbar, the search is performed as you type. You will find that often the desired term is already found after typing in 3 or 4 letters.

6.4.3 Grep

Both search mechanisms described above are restricted to searching within one source file. An additional tool which allows you to search through a (possibly large) number of files is available through the Search in Files... item in the Edit menu. It is basically a frontend for the **grep**(1) program.

In the dialog, you can specify which files are searched. There is a number of wildcard patterns available in a combobox. In this way, you can easily restrict the find mechanism to header files. Furthermore, you specify a directory where the search is started. If you check the Recursive box, the search iterates through all directories in the hierarchy below this one.

The search term is in general a regular expression following POSIX syntax. For example, you can use the term `"\<K.*"` if you want to find all words which begin with the letter K. The following characters are interpreted in a special way:

`.`	Matches any character
`^`	Matches the beginning of a line
`$`	Matches the end of a line
`\<`	Matches the beginning of a word
`\>`	Matches the end of a word
`?`	The preceding item matches less than once
`*`	The preceding item is matched zero or more times
`+`	The preceding item is matched once or more times
`{n}`	The preceding item is matched exactly n times
`{n,}`	The preceding item is matched n or more times
`{,n}`	The preceding item matches less than n times
`{n,m}`	The preceding item matches at least `n` times but less than `m` times

Backreferences to bracketed subexpressions are also available by the notation `\n`.

For C++ programmers, as special bonus there are some search templates available for typical patterns. These allow you to search for example all calls of member functions of a certain object.

Once you start the search by clicking on the Search button, it will be performed by an external, asynchronous process. All found items will appear in the view called Grep. You can then jump to the found items by clicking on them. Note that grep scans the files as they stored in the file system. If you have modified versions of them in your editor, you may get some mismatches in the line number, or some found items will be invalid. You can avoid this by saving all files beforehand.

6.5 Code Completion

(... to be written ...)

6.6 Creating New Files and Classes

(... to be written ...)

6.6.1 Editing the Templates

(... to be written ...)

Chapter 7

The File Browsers

On the left side of the main window, KDevelop can display various kinds of lists and trees for the selection of files:

File Tree This shows a tree view of the file hierarchy below the project directory. If you click on a file, it is loaded into the editor. For files which do not contain text, KDevelop starts an application that can handle the respective MIME type.

The file tree is regularly updated whenever something changes in the file system. For example, if you create new files or directories (even outside KDevelop), this is immediately reflected in the file list. On Linux®, this feature makes use of the FAM library. On other operating systems or over NFS, the directories shown are polled in small intervals.

The file tree hides files which are usually not interesting, like object files. In the Project options under File views, you can configure (as a comma separated list of wildcards) which patterns are used to filter out irrelevant files.
Furthermore, you can decide to restrict the file tree to show only files which belong to the currently loaded project. This can be toggled by clicking with the right mouse button on the root item of the tree.

File Groups This shows the files belonging to the project, grouped by their file name extension. As in the file tree, you can edit a file by clicking on it with the left mouse button.
The groups shown in this view can be configured under File views in the Project options dialog. In order to customize the view to your needs, it is helpful to understand how files are distributed on the groups. For each file, KDevelop goes through all groups from top to bottom. In each group, it looks whether the file name matches one of the patterns. If there is a match, the file is shown in this group and the iteration is aborted. This makes it clear that more general patterns should be put below more specific ones. For example, an asterisk for the Other group should be the last pattern.

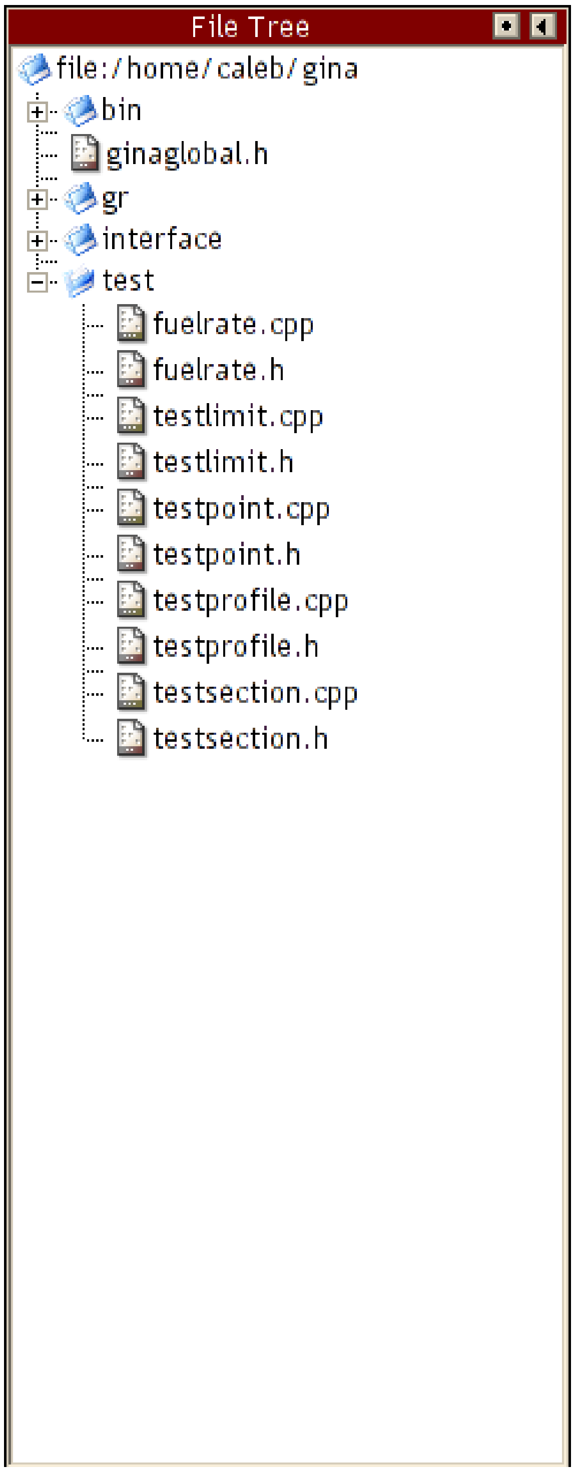


Figure 7.1: A Screenshot of the File Tree

Chapter 8

The Class Browsers

When working on a project in an object-oriented language, your emphasis when working on a project is not on the source files and their names, but on the classes and their relationships. In order to help you navigating in the space of defined classes and symbols, KDevelop includes various class browsers that visualize the class structure in different ways.

8.1 Class View

This view is shown on the left side of the main window and contains a linear list of all classes, variables and functions in your project. It is designed as a tree view. If you open a class node by clicking on it, a list with all methods and attributes of the respective class is shown.

The class view works in two different modes. By default, all symbols are grouped into 'Classes', 'Structs', 'Functions', 'Variables' and 'Namespaces'. In the context menu of the view, you can choose List by Namespaces. In this mode, the namespace hierarchy is shown and the symbols grouped into the respective namespace where they are defined. This may be more useful in projects which make heavy use of (nested) namespaces. It is less useful in projects without namespaces.

You can also change the way in which class names are displayed. Normally, the names of the classes are shown, without the namespace in which they are defined. This means, you cannot immediately distinguish classes with the same name in different namespaces. If you rest for a while with the mouse over an item, the full scoped name is shown as a tooltip though. You can decide to always display the fully scoped class name by choosing Full Identifier scopes from the context menu.

Clicking on a class or method in the class view brings you to its definition. You can also jump to the declaration of a method by choosing Go to declaration from the context menu. In the context menu for classes are also the items Add method... and Add attribute.... This opens dialogs where you can generate

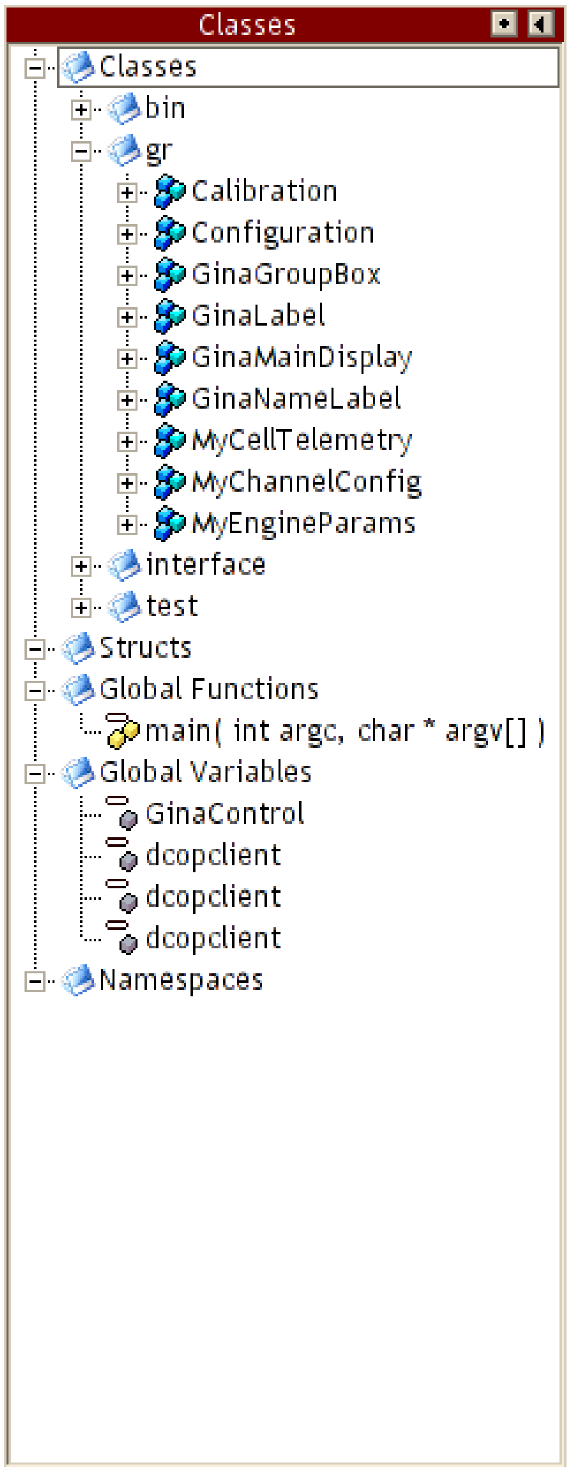


Figure 8.1: A Screenshot of the Class View

new method and variable declaration in the respective class, together with an empty implementation.

8.2 Class Tools

The class tool dialog is activated by right clicking on a class in the class view and choosing Class tool....

8.3 Class Hierarchy

(... to be written ...)

Chapter 9

Documentation

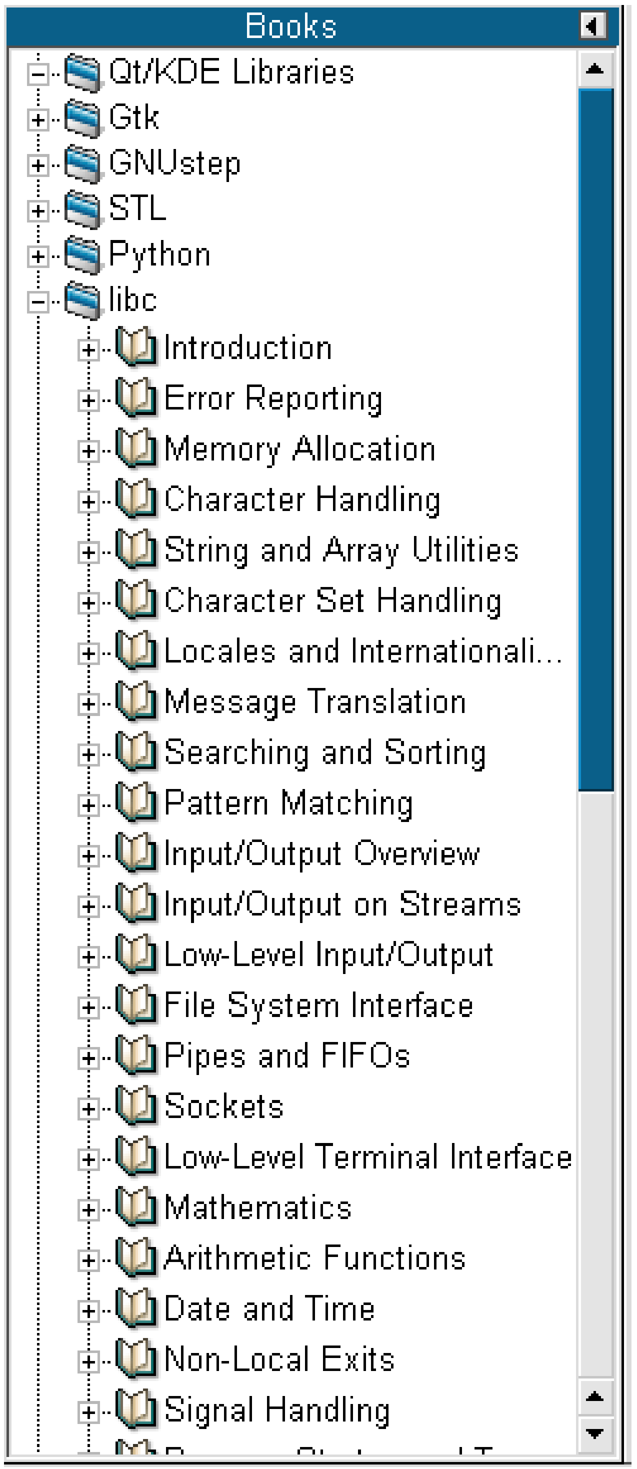
Documention unfortunately belongs to the most-overlooked programming issues. Yet, once properly set up and maintained internal and external documentation provides most valuable help.

Documentation has multiple facets. There is

- *project internal documentation*, mainly consisting of
  - *comments* in header/source files
  - *internal API documentation* of your project generated from the program file by special tools, e.g. Doxygen
- *project external documentation*, comprising among others
  - *external API documentation* of e.g. common system libraries (KDE, Qt^{TM}, etc.)
  - any other documentation (programming language manuals, general system information, how-to articles and the like)

All this documentation should be easily maintainable and ready at hand whenever you need it. KDevelop has provisions for just this.

9.1 The Documentation Browser


Books

- Qt/KDE Libraries
- Gtk
- GNUstep
- STL
- Python
- libc
  - Introduction
  - Error Reporting
  - Memory Allocation
  - Character Handling
  - String and Array Utilities
  - Character Set Handling
  - Locales and Internationali...
  - Message Translation
  - Searching and Sorting
  - Pattern Matching
  - Input/Output Overview
  - Input/Output on Streams
  - Low-Level Input/Output
  - File System Interface
  - Pipes and FIFOs
  - Sockets
  - Low-Level Terminal Interface
  - Mathematics
  - Arithmetic Functions
  - Date and Time
  - Non-Local Exits
  - Signal Handling

Figure 9.1: A Screenshot of the Documentation Tree

Chapter 10

Building and Project Management

Bernd Pol and Ian Wadham This chapter deals only with compiled projects, such as C++, Java^{TM} or Fortran projects. Projects for scripting languages like Python and PHP work very differently.

You will find here information on:

- Summary of Automake Manager containing an initial overall view of Automake Manager,
- Automake Manager Operation describing the basics of how to work with Automake Manager,

10.1 Summary of Automake Manager

In the Build systems chapter we have given a rough overview of the build systems commonly in use on UNIX® systems. In the following sections we will look at this in more detail.

There is some confusion about how to name such things. GNU calls them ‘build systems’ when it describes Automake, Autoconf and Libtool. QMake calls itself ‘a tool to write Makefiles for different compilers and platforms’. In KDE often the term ‘project management systems’ is used. We will use this term in a broader sense to describe the built-in environments in KDevelop which are used to organize and build your projects. In the context of this section, however, we will mostly talk about ‘automated build systems’.

10.1.1 The Need for an Automated Build System

If you have a simple 'Hello World' program, written in C, you can compile and link it using **gcc** `-o hello hello.c` and execute it using the command **./hello**, so you do not even need a `Makefile`.

If you have a C application with several modules and header files and you are only going to run it on your own machine (i.e. it is an in-house application), you will only need a simple `Makefile`, which is fairly easy to write by hand (use `info make` to find out more).

The complications begin when:

- Your source-code, documentation, graphics, sounds, translations, data files, etc. are located in more than one directory,
- You have a hierarchy of directories and sub-directories,
- You are using libraries that are not part of the traditional UNIX® set, such as the Qt™ Object Library or the KDE Desktop libraries,
- You are using a pre-processor to generate some of your source-code, such as Qt's MOC pre-compiler,
- You aim to distribute your application worldwide, to people who may not have the same UNIX®/Linux® system, software and hardware as you,
- You require an automated Install and Uninstall facility,
- You aim to make your application part of the KDE Desktop set.

If you have some or all of the above situations, you probably need a *build system*. In the example above we used **gcc** to compile and build the 'Hello World' program, but not all C compilers are called '**gcc**'. So if you distribute your application to someone who is using some other C compiler, your Makefile must somehow use the name of that person's compiler, otherwise your application will fail to compile—and that is just simple example of what can go wrong.

A build system will iron out these differences for you.

- It will check that the libraries you need are present on each receiving machine,
- will automatically scan all your application directories for files to pre-process, compile or install and
- will install the components of your application in the correct receiving directories, making sure that
- the directories are created in the receiving machine as required.

In brief, a build system offers safe and secure methods for your application to be compiled and installed correctly on any receiving machine. As we have shown before in the Project Management Systems survey, KDevelop offers three automated build systems and the option of creating your own Makefile, in short (click on the project names to get more information):

- Automake projects which use the GNU standard development tools.
- QMake projects which use the trolltech QMake project manager.
- ANT projects which use the Apache ANT project manager for Java^{TM} development.
- Custom projects which require you to maintain your own `Makefiles`.

IMPORTANT
One of these four alternatives must be chosen when you create a project and *the choice is difficult to change later*, so you should give it some thought before you start.

10.1.2 Tutorials on Autoconf/Automake/Libtool

There are several tutorials available on the GNU Build System (**Autoconf**, **Automake** and **Libtool**) of which the Automake Manager makes use.

- A short autoconf tutorial written by Christopher W. Curtis available on the KDevelop home page. It concentrates on some basic steps to modify a `Makefile`.
- A more detailed tutorial can be found in a greater set of tutorials on Developing software with GNU.
- And there is the famous Goat Book, titled 'Autoconf, Automake, and Libtool'. This is an easily readable, yet concise, introduction in all main aspects of the GNU Autotools.

10.1.3 What does Automake Manager Do?

The Application Wizard will have set up some initial `Makefile.am` files when you created a New Project of a type that uses the GNU Build System, such as C++ → KDE → Application framework. During development Automake Manager creates any other `Makefile.am` files for projects that use the GNU Build System and maintains them all, Application Wizard and Automake Manager created alike.

There will be one `Makefile.am` file in each directory of your project that contains files to be compiled or installed. It will contain your specifications for compiling, building and installing files and a reference to any subdirectories that also have a `Makefile.am` file and possibly some files to compile, build and install.

> NOTE
> Your project's directories and source files may be structured to any depth, or you may prefer a flat project-structure with all subdirectories at the top level.

The aim of the GNU Build System is to produce source-code file structures that can be compiled, built and installed on any UNIX® or Linux® system by using the simple commands:

```
./configure
make
make install     # Usually as "root".
```

and can be uninstalled by the command **make uninstall** (usually as root).

How does this work? Well **configure** is a script that

- works out the details of whatever system it is in, such as what compiler and libraries to use and where they are located, and then
- creates recursive `Makefile` files by filling in the substitutions in the corresponding `Makefile.in` files.

The `Makefile.in` are 'input' files—templates which provide basic information for the `Makefile`s to be produced from them by filling in some system dependent information. They are generated by the **Automake** utility from the `Makefile.am` files.

The process of going from `Makefile.am` (`.am` denotes 'Automake' template files) to `Makefile` files is handled automatically by the KDevelop Project Manager, using the **Autoconf** utility, **M4** macros and other arcana we need not go into here.

So when **make** runs, it automatically picks up the correct pieces from the current environment, such as compilers and libraries. Similarly, **make install** puts your application components, such as executables, documentation and data files in the correct places for that environment.

If you distribute your application as a 'tarball' (a single compressed file that KDevelop can create for you), it will include the `Makefile.in` files and the `configure` script file, so the recipient can compile, build and install your application without having **Automake**, **Autoconf** or KDevelop on their machine. The `Makefile.am` files are also included, just in case the receiver needs to do any source-code modifications.

> NOTE
> The rules are rather different if you distribute via a web-based source-code repository such as KDE CVS.

10.1.4 Summary of What Automake Manager Does

- Generates `Makefile.am` files in subdirectories it knows as 'subprojects'.
- Updates `Makefile.am` files as the project structure changes.
- Updates `Makefile.am` files as files are added to or removed from the project.
- Accepts definitions of how the various files are to be built or installed and modifies the `Makefile.am` accordingly.
- Accepts parameters used in building or installing (e.g. library names) and ensures that they are used in the required compilation and build steps.

10.1.5 Contents of Automake Files

A `Makefile.am` file has lines containing variable-names followed by an equals sign and a list of files or parameter values. The 'variables' have two-part names, such as `bin_PROGRAMS`, `myapp_SOURCES` or `kdelnk_DATA`. The second part is called the *primary* and represents something from which to build or install. The first part is called the *prefix* and represents:

- A *directory* in which to do installation (e.g. `bin`),
- A *qualifier* for the primary (e.g. `myapp` for `SOURCES`, indicating that the source files listed after `myapp_SOURCES` go into building `myapp`),
- A special *prefix* `noinst` (short for 'no installation'), usually used to list program header files (`.h`),
- Or the special prefix `EXTRA`, for *configuration-dependent* stuff.

For more information on **Automake** and `Makefile.am` files, look up `info Automake`.

Basically, Automake Manager creates and updates the variable-names and lists of files or parameters. See the following example of a `Makefile.am` for a typical application, called `myapp`.

```
## Makefile.am for myapp

# this is the program that gets installed.  it's name is used ↩
    for all
# of the other Makefile.am variables
bin_PROGRAMS = myapp

# set the include path for X, qt and KDE
INCLUDES = $(all_includes)

# the library search path.
myapp_LDFLAGS = $(KDE_RPATH) $(all_libraries)
```

```
# the libraries to link against.
myapp_LDADD   = $(LIB_KFILE) $(LIB_KDEPRINT)

# which sources should be compiled for myapp
myapp_SOURCES = main.cpp myapp.cpp myappview.cpp

# these are the headers for your project
noinst_HEADERS = myapp.h myappview.h

# let automoc handle all of the meta source files (moc)
METASOURCES = AUTO

KDE_ICON = myapp

# this is where the kdelnk file will go
kdelnkdir = $(kde_appsdir)/Utilities
kdelnk_DATA = myapp.desktop

# this is where the XML-GUI resource file goes
rcdir = $(kde_datadir)/myapp
rc_DATA = myappui.rc

AM_CXXFLAGS = -DMY_C++_PREPROCESSOR_OPTION
```

As you can see, many of the items on the right hand side are symbols of the form `$(xxx)`. These are *environment variables* which are defined in the actual KDE environment and are substituted with real values when **./configure** generates the final `Makefile` files in the receiving machine.

Also, sometime after you have started with KDevelop, it is a good idea to run the command **./configure --help**, which will show you the range of things you can change at build and installation time, such as for a test environment. In particular, the command:

```
./configure --prefix=/where/you/wish
```

will re-direct the entire installation to a directory structure of your choice, by changing the internal variable `$(prefix)` to value `/where/you/wish`.

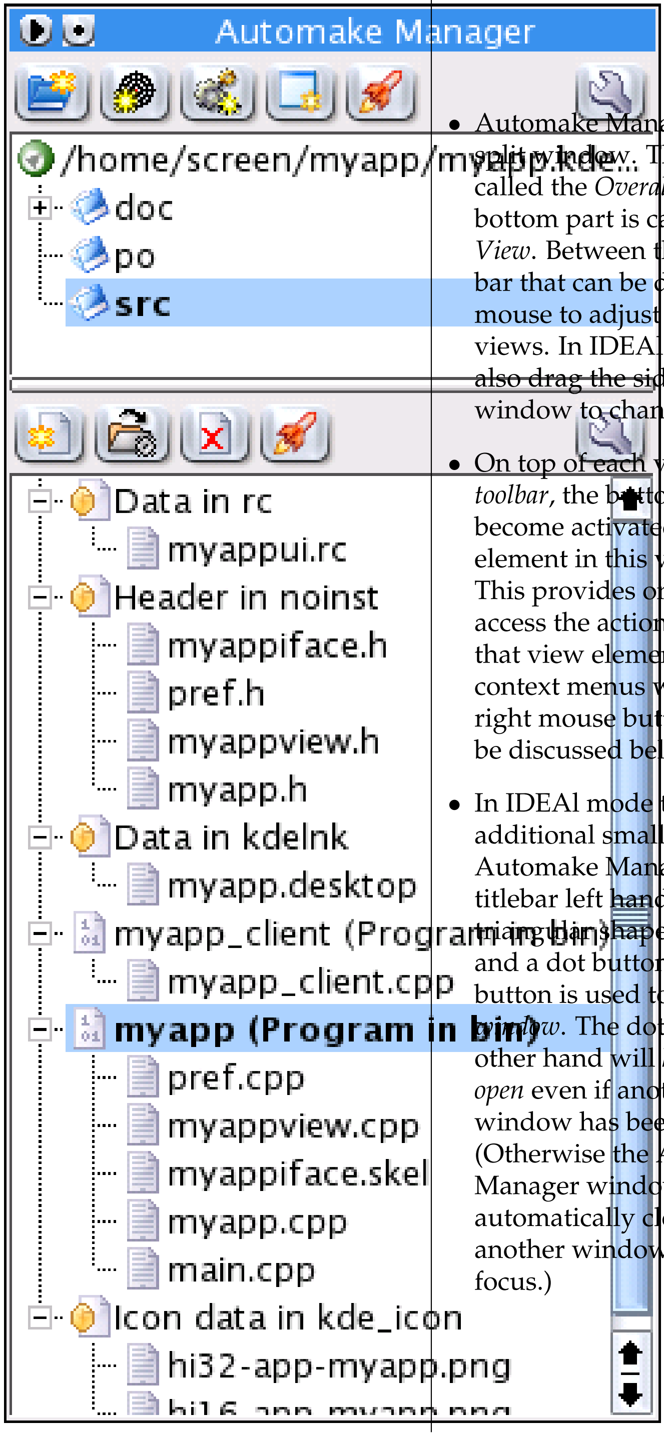
10.2 Automake Manager Operation

In this chapter you will find a basic description of the Automake Manager elements and how to use them. This covers:

- The Automake Manager Window describes the basic structure of the Automake Manager main window.
- The Overall View Window describes the elements of the upper subwindow.

- The Detail View Window describes the elements of the lower subwindow.
- Navigating in the Automake Manager lists some basic operations you can perform in the Automake Manager.
- Popup Menus in the Automake Manager describes the windows which will pop up when you select an action in the Automake Manager.

10.2.1 The Automake Manager Window



- Automake Manager runs in a split window. The top part is called the *Overall View* and the bottom part is called the *Detail View*. Between them is a narrow bar that can be dragged with the mouse to adjust the sizes of the views. In IDEAl mode you can also drag the side of the split window to change the width.

- On top of each view there is a *toolbar*, the buttons in which will become activated when an element in this view is selected. This provides one way you can access the actions provided for that view element. The other are context menus which pop up on right mouse button click as will be discussed below.

- In IDEAl mode there are two additional small buttons in the Automake Manager window titlebar left hand side &#8211; a triangular shaped right arrow, and a dot button. The arrow button is used to *close the window*. The dot button on the other hand will *keep the window open* even if another KDevelop window has been selected. (Otherwise the Automake Manager window will automatically close whenever another window gets the input focus.)

10.2.2 The Overall View Window

The overall view window contains a tree-list of all the directories in your project that contain program files, documentation or data. Each such directory contains a `Makefile.am` file and is known in Automake Manager as a *subproject*. There are three typical subprojects in a KDE-based project as shown in the above illustration:

- `src` – source-code files for your application,
- `doc` – your user manual or Handbook,
- `po` – extracts of strings in your source-code files that require translation into other human languages (e.g. window titles, menu names, button labels, dialog box text and messages of various kinds).

Note that the `doc` subproject always has an `en` subproject, which you can see if you click on the + symbol next to the word `doc`. That is because the base language of all documentation in KDE is United States English (en). If your application becomes part of KDE, the KDE translation teams may translate your documentation from United States English into other languages and the translations will go into other subprojects, such as `de` (German) or `fr` (French). The strings in the `po` subproject may also be translated and stored in other files in `po`, thus allowing your application to be operated by people who do not know English.

NOTE
The `doc` and `po` subprojects serve different purposes. `doc` contains *documentation* like a user manual, `po` contains translatable text strings of the *user interface* which is integrated in the source code of this application.

The overall view window serves—amongst other things—as a navigation tool. If you select a subproject in the overall view window, the corresponding details will be shown in the detail view window.

10.2.3 The Detail View Window

The detail view contains a tree-list of all the files in the subproject currently selected in the overall view as well as the compilation, build and installation rules for this subproject. Thus the two views together can give you access to all the components of your application and all the information on how to compile, build and install it.

10.2.3.1 Targets

The tree-list in the detail view has two levels. The top level consists of so-called Automake Manager *targets* and the next level contains lists of files that go to make up each target.

This concept of an Automake Manager target differs somewhat from what a `Makefile` target usually is. In short:

- The definition of how a set of files is to be compiled, built or installed is known as a *target* in Automake Manager, but as a *variable* in **Automake** itself.
- A *target* in **make** is often something quite different, being the parameter of a **make** command (e.g. `make install`, `make clean`).

  However some `Makefile.am` variables do represent an underlying *sub-target* in **make**.

10.2.4 Navigating in the Automake Manager

In both the overall and the detail view you can left-click on the + or - next to a subproject or target name to expand or contract the tree view. If you do that with a *subproject* in the overall view, it shows or hides the subprojects at the next level down (if any). If you do it with a *target* in the detail view, it shows or hides the list of files that go into that target.

Opening a file for Edit If you *left mouse button click* on a file name in the detail view, the corresponding file opens up in KDevelop's editing window.

Activating the Automake Manager Toolbar Buttons If you *left mouse button click* on the name of a subproject in the overall view or target in the detail view, the name is highlighted and some toolbar buttons become active in the top part of that view.

NOTE
It is recommended that you use the *right mouse-button and popup menus*, rather than the toolbar buttons, because it is then much easier to see and understand what you are doing.
Operations on subprojects and targets have far-reaching effects on the structure, compilation, building and installation of your application.

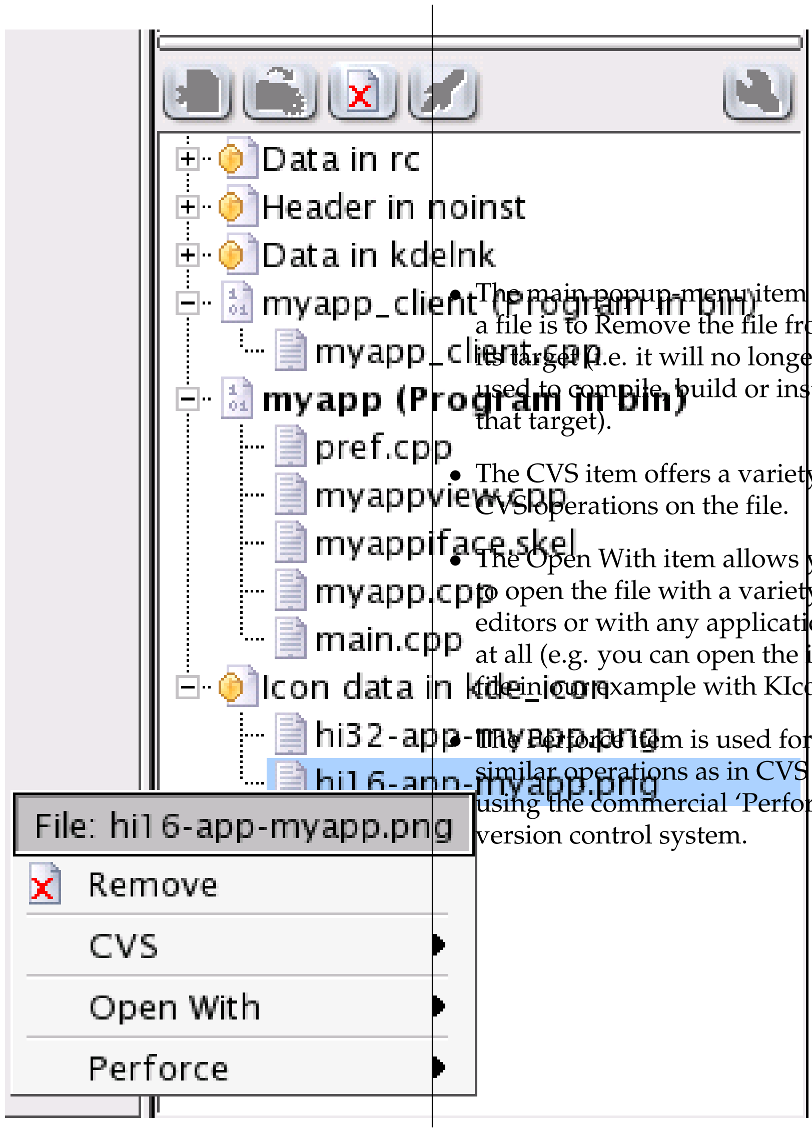
Selecting Actions/Popup Menus If you *right mouse button click* on the name of a subproject, target or file, a menu pops up and you can then select actions to perform on the subproject, target or file, such as add a target to the subproject, add a file to a target or logically remove the selected file from its target.

10.2.5 Popup Menus in the Automake Manager

The following sections explain in short terms which operations the menus make available which will pop up on right mouse button clicks in the Automake Manager window. They are meant for overall view only. You will find detailed descriptions of most operations in a later chapter.

10.2.5.1 The Popup Menu for a File

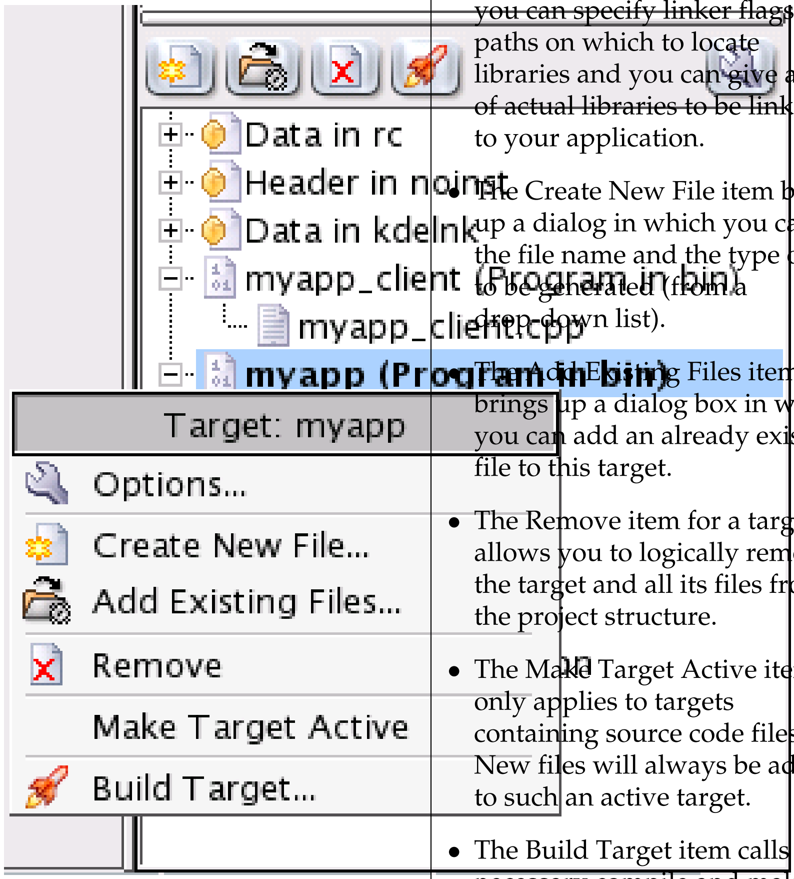
When you right mouse button click on a *file name* in the detail view the following menu will pop up allowing you to select one of several operations to be performed on that file. In the illustration below the `hi-16app-myapp.png` icon file was selected from the Icon data in myapp target of the myapp/src subproject.



- The main popup-menu item for a file is to Remove the file from its target (i.e. it will no longer be used to compile, build or install that target).
- The CVS item offers a variety of CVS operations on the file.
- The Open With item allows you to open the file with a variety of editors or with any application at all (e.g. you can open the icon file in our example with KIcon).
- The Perforce item is used for similar operations as in CVS using the commercial 'Perforce' version control system.

10.2.5.2 The Popup Menu for a Target

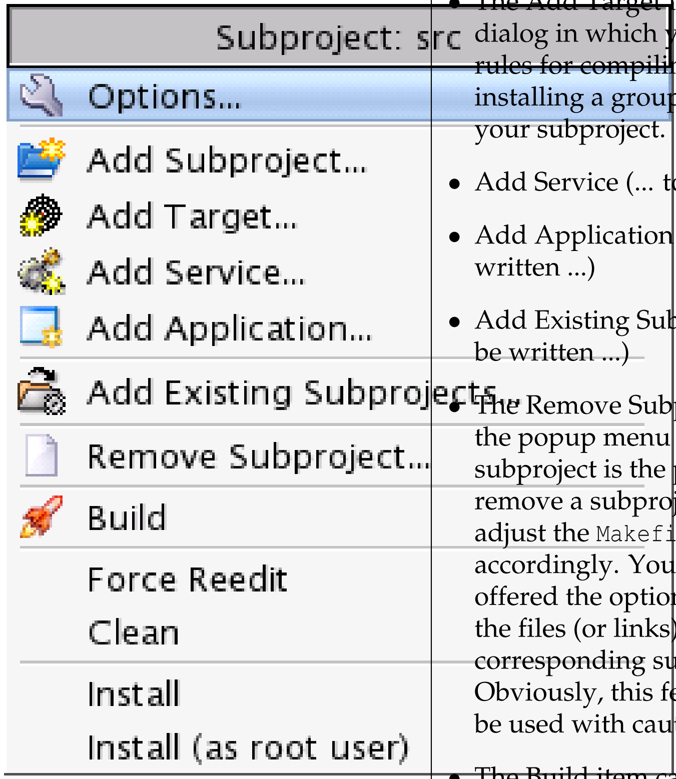
When you right-click on a *target* in the detail view the following menu will pop up allowing you to select one of several operations to be performed on it. In the illustration below the myapp (Program in bin) target of the myapp/src subproject was selected.



- The Options item for a target only applies to source code files. In the corresponding dialog box you can specify linker flags and paths on which to locate libraries and you can give a list of actual libraries to be linked in to your application.
- The Create New File item brings up a dialog in which you can set the file name and the type of file to be generated (from a drop-down list).
- The Add Existing Files item brings up a dialog box in which you can add an already existing file to this target.
- The Remove item for a target allows you to logically remove the target and all its files from the project structure.
- The Make Target Active item only applies to targets containing source code files. New files will always be added to such an active target.
- The Build Target item calls all necessary compile and make operations to build the code for this target only.

10.2.5.3 The Popup Menu for a Subproject

When you right mouse button click on a *subproject* in the overall view window the following menu will pop up which allows you to make major changes to the structure of your project and the way it is compiled, built and installed. You can use it to expand or modify the basic project structure that the Application Wizard has created.



- The Options item for a subproject controls the way that the subproject will be compiled, built and installed. The dialog box that pops up has tabs for Compiler, Includes, Prefixes and Build Order.
- The Add Subproject item creates a new directory and skeleton Makefile.am file.
- The Add Target item pops up a dialog in which you can set the rules for compiling, building or installing a group of files within your subproject.
- Add Service (... to be written ...)
- Add Application (... to be written ...)
- Add Existing Subprojects (... to be written ...)
- The Remove Subproject item in the popup menu for a subproject is the proper way to remove a subproject. It will adjust the `Makefile.am` files accordingly. You will also be offered the option to delete all the files (or links) in the corresponding subdirectory. Obviously, this feature should be used with caution.
- The Build item calls all necessary compile and make operations to build the code for this subproject only.
- Force Reedit (... to be written ...)
- Clean (... to be written ...)
- Install (... to be written ...)
- Install (as root user) (... to be written ...)

10.3 Automake Projects

(... to be written ...)

10.3.1 Autoconf

`Makefile.in` into `Makefile`

```
prefix = @prefix@
INSTALL = @INSTALL@
build_triplet = @build@
CXX = @CXX@
```

```
prefix = /home/bernd/kde3
INSTALL = /usr/bin/ginstall -c -p
build_triplet = i686-pc-linux-gnu
CXX = g++
```

`config.h.in` into `config.h`

```
/* Define if you have libz */
#undef HAVE_LIBZ
/* The size of a ‘int’, as computed by sizeof. */
#undef SIZEOF_INT
```

```
/* Define if you have libz */
#define HAVE_LIBZ 1
/* The size of a ‘int’, as computed by sizeof. */
#define SIZEOF_INT 4
```

10.3.2 Automake

(... to be written ...)

10.3.3 KDevelop’s Automake Manager

10.3.4 Building and Installing Libraries

- -rpath
- PIC
- static
- plugins: no-undefined

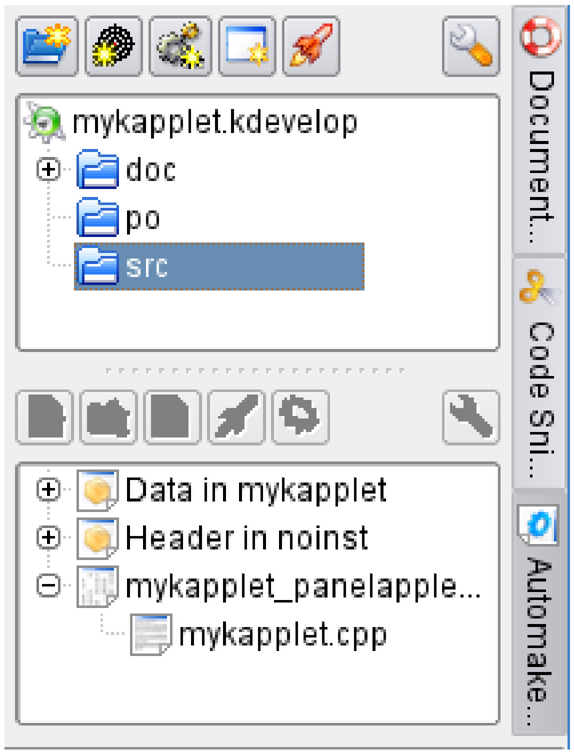


Figure 10.1: A screenshot of the automake manager

10.4 Custom Makefiles and Build Scripts

(... to be written ...)

10.5 Compiler Options

(... to be written ...)

10.6 Make Options

(... to be written ...)

Chapter 11

Advanced Build Management

11.1 Multiple Build Configurations

(... to be written ...)

11.2 Cross-Compiling

When you have suitable cross compilers available, you can cross compile your programs for processors and operating systems different from the system where KDevelop and the compiler is running. The GNU compiler collection **gcc** can be configured and compiled as a cross compiler if you compile it yourself. Consult the GCC info pages for more information. Some Linux® distributions also provide binary packages.

An automake based package can easily be cross-compiled by specifying the `--host` option to the configure script and setting the `CC` and `CXX` environment variables to the respective cross compiler binaries. Often you want to switch between a the cross-compiled version of your application and one compiled for your development system. For this, it is advantageous to use KDevelop capability of creating multiple build configurations, as explained in Section 11.1. Once you have created a new build configuration for cross-compiling in the Project → Project Options... dialog, add the option

```
--host=platform
```

to the configure options. The *`platform`* name is a tuple of the form

```
cpu-vendor-os
```

or

```
cpu-vendor-kernel-os
```

For many combinations, you can use a short form, for instance *i386-linux* or *arm-elf*.

11.3 Qt/Embedded

Qt/embedded is a version of the Qt™ library that does not use the X window system, but draws directly to the framebuffer on Linux® systems. It is therefore interesting for embedded systems which have tight restrictions on the memory usage of the whole system. Its API is fully compatible with the one of the X11 version.

Developing an application for Qt/embedded with KDevelop is not very different from developing a program for the X11 version of Qt™. In fact, you can use the same codebase for both versions. If you use the autoproject project management, you switch to the embedded version by passing the argument `--enable-embedded` to the configure script. You can set this in the Project → Project Options... dialog under Configure Options. With the option `--with-qt-dir=DIR` you set the directory in which Qt/embedded is installed.

After configuring and compiling your application with these options, it will link with the `libqpe.so` library. This version of your application will not normally run when you use X11. In order to test it, run it under the control of the program qvfb (Qt™ Virtual Frame Buffer). This is done by starting qvfb and then starting your application with

```
app -qws -display QVFb:0
```

Naturally, when you have a working version of your application, you will want to use it on the target processor. For this, it will probably be convenient to create multiple build configurations, as explained above, so that you can quickly switch between the version running on your development system and the version running on the target system.

Applications for Qt/embedded normally run as single applications on the device they are designed for. Trolltech also supports Qtopia, which is a collection of applications for PIM, web browsing and various other areas that work together in a consistent manner. It is the standard environment for instance on the Sharp Zaurus. You can write applications that integrate into this environment by using the Qtopia SDK. This implies making your application class a subclass of `QPEApplication` and linking to the library `libqpe.so`. If you develop your application with the autoproject project management, you have to add `--enable-qtopia` to the configure options.

Chapter 12

The Debugger Interface

For C and C++, KDevelop contains an internal debugger that is directly integrated with the editor. Technically, it is implemented as a frontend that uses the portable GNU debugger gdb through a pipe. The debugger can be started in several ways:

- With Debug → Start, the main program of your project is loaded into the debugger.
- Using Debug → Start (other) → Examine core file you load a core file into memory, which is generated by the operating system kernel when the program has crashed (The generation of core files may be switched off on your system, see ulimit(1)). This is useful for a post-mortem analysis of a program.
- With Debug → Start (other) → Attach to process you invoke the debugger on an already running program. You will be shown a process list where you can select the process which the debugger should take over.
- Note that debugging is only possible if your project has been compiled with debugging information enabled. It can be activated in the Compiler options dialog. When this option is switched on, the compiler generates additional data which allows the debugger to associate file names and line numbers with addresses in the executable.

The debugger frontend offers several views 'into' the process:

If you try to debug a project without debugging information, you get the message `No source...` in the status bar.If you try to set a breakpoint, it is shown as `Pending (add)` in the breakpoint window (see below).

Variables This window lists the values of all local variables at the current execution point of the program. It covers the variables in the complete call stack, i.e. the function where the process was interrupted, the function that called this function, and so on up to `main()` function.

Another branch in the variables contains watch variables. You can configure yourself which variables are shown here. Both local and global variables can be watched. You can add variables either by clicking on the Add button or pressing **Return** while the Watch item is selected. They can be removed again via the context menu.

Frame Stack (... to be written ...)

Breakpoints This window allows you to see and manipulate the breakpoints. Remember that KDevelop uses GDB, so to fully understand the KDevelop debugging features, you should know a little bit about the GDB.

If you want to look at the source code, breakpoints are defined in `kdevelop/languages/cpp/debugger/breakpoint.h`.

At the left edge, the window has buttons to:

- Add an empty breakpoint
- Edit the selected breakpoint
- Delete the selected breakpoint
- Remove all breakpoints

The main part of the window is a table with 7 columns. Each line in the table is a breakpoint. The columns are:

1. Selection checkbox
2. Type: one of: Invalid, File:Line, Watchpoint, Address, Function
3. Status. Values are:
   - Active
   - Disabled: Each breakpoint may be ‘enabled’ or ‘disabled’; if disabled, it has no effect on your program until you enable it again.
   - Pending (add): a breakpoint is marked like this if no debugging information is available. From GDB Info page:

     > If a specified breakpoint location cannot be found, it may be due to the fact that the location is in a shared library that is yet to be loaded. In such a case, you may want GDB to create a special breakpoint (known as a ‘pending breakpoint’) that attempts to resolve itself in the future when an appropriate shared library gets loaded.
4. Pending (clear)
5. Pending (modify)
6. Location in the format filename:linenumber
7. Condition
8. Ignore Count: If this is a number `COUNT` greater than zero, the next `COUNT` times the breakpoint is reached, your program’s execution does not stop; other than to decrement the ignore count, gdb takes no action.
9. Hits: counts how many times a breakopint has been hit.

Disassemble (... to be written ...)

12.1 Setting Breakpoints

(... to be written ...)

12.2 Options

Display Mangled Names In C++, function names in the executable are 'mangled', i.e. the function names include information about the argument types. This is necessary in order to support overloading of functions. The mangling algorithm is not standardized and differs even between different versions of the GNU C++ compiler.

In the disassembling window, normally unmangled names are displayed, so function signatures appear in the similar way as in the source code, so they are easily readable. Alternatively, you can decide to see mangled names.

Try Setting Breakpoints on Lib Load The debugger backend gdb does not allow to set breakpoints within code that is not currently loaded. In a highly modular application, where often code is only loaded on demand as a plugin (using the libc function `dlopen(3)`), this can be inconvenient. Therefore, KDevelop rolls its own support for breakpoints in shared libraries. If you set this option, it allows you to set breakpoints in libraries which are not loaded. Then, whenever gdb notifies that a library is loaded, KDevelop tries to set the pending breakpoints.

Enable Floating Toolbar (... to be written ...)

Chapter 13

Using CVS

13.1 CVS Basics

CVS is the revision control system which many open source projects - including KDE — are using. It stores all sources codes in a central place, called the *repository*. From the repository, developers can check out a current version of the project or snapshots of it at arbitrary points of time. In contrast to some other revision control systems, it is not necessary to *lock* files one wants to work on. So development can be highly parallelized.

Whenever a developer has finished a task, he *commits* his code (accompanied by a log message). CVS takes the job to merge the changes made by several developers. It can of course happen that developers work on the same piece of code, resulting in a conflicting set of changes (in practice this occurs seldom, and is often a sign of a lack of communication). In this case CVS rejects a commit; only after all conflicts are resolved, a file can be committed.

So far, this has been a description of the basic features of CVS one usually has to cope with. But CVS can provide a lot more: One can maintain several branches of a project (e.g. KDE 1.1.2 and KDE 2 were branches in KDE's development tree), merge changes from one branch to another, ask for differences between revisions, the revision history of files etc.

CVS is implemented as a client-server system. As a user, all communication with the repository goes through the command line program CVS. A higher level user interface is available through frontends like Cervisia (`http://cervisia.sf.net`) or TkCVS (`http://tkcvs.sf.net`). In KDevelop, only a small part of the CVS functionality which is important for your daily work can be used directly.

Basic knowledge of CVS usage is assumed. In particular, you should know how to checkout a given project from the repository. We recommend the book 'Open Source Development With CVS' by Karl Fogel which is freely distributed (except for the non-technical chapters). See `http://cvsbook.red-bean.com/cvsbook.html`.

13.2 CVS Commands in KDevelop

In the file views, the following context menu items are available:

Add to Repository Prepares the marked file for addition to the repository. The file is transferred to the repository when you commit it (or the containing directory) the next time.

Remove from Repository Prepares a file for removal from the repository. This also deletes the file on the local file system, so use this feature with care!

Update Runs **cvs update** to merge any changes from other users into your working directory. When you use this menu item over a directory, the update normally happens recursively, except if you have disabled this in the configuration file `.cvsrc`.

Commit Runs **cvs commit** to upload any locally made changes to the repository. Note that you should update before doing this. Otherwise, when another user has committed his own changes before, CVS may give you an error message.

All these commands are invoked as subprocesses by KDevelop without any further command line options or environment variables. This may be a problem when the connection with the CVS server goes through a ssh connection and requires that you enter your password each time you commit or update. This is for instance necessary when your project is hosted on `sourceforge.net`. Workarounds for this problem are described on the CVS/SSH FAQ which you can find in the SourceForge documentation.

13.3 Behind the Scenes

13.3.1 What CVS Records in the Working Directory

(... to be written ...)

Chapter 14

Credits

14.1 Contributions

- The initial contents of this manual were witten by Bernd Gehrmann bernd@kdevelop.org and Caleb Tennis caleb@aei-tech.com.
- The Summary of Automake Manager and Automake Manager Operation chapters were written by Ian Wadham, ianw@netspace.net.au).

Appendix A

Installing KDevelop

In this chapter we will discuss the steps necessary to compile and install the KDevelop IDE:

- How to obtain KDevelop mainly concentrates on downloading the most recent KDevelop sources from svn.
- KDevelop requirements lists the programs and libraries which you need installed to successfully compile the IDE.
- KDevelop compilation and installation leads you through all the steps of compilation and installation of the application.
- How to obtain a KDevelop API documentation tells what an API is and how you get such a useful tool for navigating the KDevelop sources.

A.1 How to Obtain KDevelop

KDevelop is available in binary form from many different Linux® distributions such as SuSE, RedHat and others. These binaries are packed in some convenient format, mostly RPM, for easy installation. To install, follow the standard instructions given in your distribution.

You may as well obtain the KDevelop sources, compile and install them by yourself. These sources can be found via the project home page at http://www.kdevelop.org or via the KDE ftp site.

A.1.1 Get Daily KDevelop Snapshots from svn

If you want to be in front of current development, anonymous svn repository snapshots are available.

The module name is *kdevelop* at `svn co svn://anonsvn.kde.org/home/kde/b-ranches/KDE/3.5/kdevelop`.

A.1.1.1 Initial svn Checkout

To obtain an initial version of KDevelop you must download it from anonymous svn. For this so-called *checkout* operation follow these steps.

NOTE
We assume you want to put your KDevelop copy into the `kde3src` subdirectory of your home directory ( ).

# Create the destination directory, if necessary:

```
> mkdir kde3src
> cd kde3src
/kde3src> svn co svn://anonsvn.kde.org/home/kde/branches/KDE/3.5/kdevelop
/kde3src> cd kdevelop
```

NOTE
Once you have successfully checked out your KDevelop version, you may keep up with the changes using the update procedure shown in the next section.

IMPORTANT
Keep the server load low. *Please do not checkout every time you want to keep your KDevelop up to date!* Use svn update for this purpose.

Now you may compile your KDevelop version as shown in the KDevelop Compilation and Installation section.

A.1.1.2 Keeping Your svn Copy up to Date

After you checked out (and successfully compiled) KDevelop from svn as shown above, you'll want to keep it up to date in order to get all the patches. Follow these steps. (We again assume you have put your KDevelop copy into the `kd-e3src` directory.)

Note the **up** (= *update*) command instead of the **co** (which stands for *checkout*).

```
> cd kde3src
/kde3src> cd kdevelop
/kde3src> svn up
```

NOTE
Keep an eye on the messages svn produces during the update sequence. The exact steps in the compilation sequence depend on this.

Now you can compile a new KDevelop version as shown in the Special svn compilation considerations chapter.

A.2 KDevelop Requirements

In order to successfully compile and use KDevelop, you need the following programs and libraries. They are available on most platforms as distribution packages and thereby can be installed easily.

REQUIRED:

- gcc/g++ &#8805; 2.95.3 (or compatible)
  Available from gcc.gnu.org
- GNU make (or compatible)
  Available from www.gnu.org/software/make
- Perl 5.004 (or higher)
  Available from www.perl.com
- autoconf &#8805; 2.52 (or higher)
  Available from www.gnu.org/software/autoconf
- automake &#8805; 1.6 (or higher)
  Available from www.gnu.org/software/automake
- flex 2.5.4 (or higher)
  Available from www.gnu.org/software/flex
- Qt™ &#8805; 3.3.0 (or higher)
  Available from www.trolltech.com/products/qt
- KDE &#8805; 3.4.0 (or higher)
  Available from www.kde.org

OPTIONAL:

- The *ctags* source navigation tool, from http://ctags.sourceforge.net, which enables you fast access to declarations and definitions by a few simple clicks on a name in the editor.

- *dot*, a graphics language compiler, from http:/www.graphviz.org. This tool is needed in conjunction with Doxygen below if you want to have class relationships graphically displayed (which is highly recommended).
- The *Doxygen* documentation tool, from http://www.doxygen.org if you want to generate concise and powerful API documentation from your projects.
- *valgrind* from http://developer.kde.org/ sewardj/ helps you to find memory management problems in your applications.
- *svn* from http://subversion.tigris.org/ if you want to use the svn versioning system.
- Any other compiler and/or tool in case you want to develop for another language/platform than C++/KDE or use some special facility.

NOTE

1. You can, to a certain extent, circumvent the need for **autoconf** &#8805; 2.52 and **automake** &#8805; 1.6. Just remove the `admin` directory in your KDevelop installation directory and type

   ```
   (your-kdevelop-directory)> ln -s $KDEDIR/share/apps/kdelibs/admin admin
   ```

   at the console. This causes KDevelop to use the standard settings in the KDE `admin` directory instead.
2. Be careful *not to mix Qt™ versions*. Always link KDevelop to the same Qt™ version your KDE library was compiled. Otherwise you will most likely experience *very strange* behaviours.

A.3 KDevelop Compilation and Installation

Once all requirements are met, you are ready to compile and install KDevelop. This appendix will discuss the necessary steps to do so.

- Preliminary Steps tells you about setting up a proper environment.
- Compile KDevelop deals with obtaining the KDevelop sources from svn, how to prepare them for the installation process, and finally shows the steps necessary to compile and install KDevelop.
- Some Notes on configure Options tells you how to run KDevelop if it has been installed in a location other than the KDE directory.

A.3.1 Preliminary Steps

Before entering the compile sequence you must make sure all libraries and tools are available to the make system. To accomplish this some environment variables need to be properly set. The actual steps to be performed depend on the console shell you use.

> **NOTE**
> To avoid typing in all the statements that set the necessary environment variables every time you want to compile, you should put them into your `.bashrc` or `.cshrc` file. This way the environment variables will be properly set every time you start the shell.

A.3.1.1 Setting the Environment for the bash Shell

If you use the bash shell add the following lines:

```
export KDEDIR=(path to your KDE installation)
export QTDIR=(path to your Qt library)
export LD_LIBRARY_PATH=$QTDIR/lib:$KDEDIR/lib:$LD_LIBRARY_PATH
export LIBRARY_PATH=$QTDIR/lib:$KDEDIR/lib:$LIBRARY_PATH
export PATH=$QTDIR/bin:$KDEDIR/bin:$PATH
```

A.3.1.2 Setting the Environment for the tcsh Shell

If you use the tcsh shell add the following lines:

```
setenv KDEDIR (path to your KDE installation)
setenv QTDIR (path to your Qt library)
setenv LD_LIBRARY_PATH=$QTDIR/lib:$KDEDIR/lib:$LD_LIBRARY_PATH
setenv LIBRARY_PATH $QTDIR/lib:$KDEDIR/lib:$LIBRARY_PATH
setenv PATH $QTDIR/bin:$KDEDIR/bin:$PATH
```

A.3.2 Compile KDevelop

> **NOTE**
> In the following discussion we assume that you have put your KDevelop sources in the `/kde3src/kdevelop` directory.

A.3.2.1 Special svn Compilation Considerations

In case you use a KDevelop snapshot from svn the initial compilation steps depend on whether you just did a complete checkout or only updated the source.

After a svn Checkout You must *initialize the make system* after a fresh checkout. The same is true every time you need to start over from scratch. Type:

```
/kde3src/kdevelop> make -f admin/Makefile.common svn-clean
```

and then *all of the following steps*.

NOTE
You might need access to the svn repository for the clean-up if any corrupted or missing files must be reconstructed.

IMPORTANT
The **svn-clean** command will *remove every file* not in svn from the directory! Make sure to back up any valuable information before you issue this clean-up command.

After a svn Update The next step depends on the output of the svn update sequence. If you got something like (there may be a U or a P marker in the leftmost column, both denoting the file has been changed):

```
U /some_directory_path/Makefile.am
```

or if you just did a full checkout, you must enter:

```
/kde3src/kdevelop> make -f Makefile.svn
```

before you proceed with *all of the following steps*.

A.3.2.2 Basic make Command Sequence

Once the basic make system is set up you must decide which type of the KDevelop system you want to use. This is done in the following configure step which builds the actual `Makefile`s the **make** command will use.

NOTE
You may drop the `--prefix` option in the following **configure** command lines if you want KDevelop be installed in the default KDE directory. See the Some notes on configure options chapter for this.

A Debug-Compiled Version If you want to keep track of what your KDevelop application does at run-time you may build a debug-compiled version. Just command **configure** to do so:

```
/kde3src/kdevelop> ./configure --enable-debug=full --prefix=(where-your-kde3-is)
```

A Release-Compiled Version If you only want to use KDevelop as-is a (smaller and faster running) release version suffices. **configure** defaults to this.

```
/kde3src/kdevelop> ./configure --prefix=(where-your-kde3-is)
```

NOTE
If you want to build your own API documentation for KDevelop you must include yet another option in the **configure** command:

```
/kde3src/kdevelop> ./configure --(options-as-above) \
--with-kdelibsdoxy-dir=$KDEDIR/share/doc/HTML/en/kdelibs-apidocs
```

Make and Install KDevelop **configure** will check the system and build some `Makefile`s according to what it found. The **make** command will use the main `Makefile` by default. Thus

```
/kde3src/kdevelop> make
```

suffices. If necessary, now gain root user rights using the command

```
/kde3src/kdevelop> su
```

and entering the root password. Then install the application:

```
/kde3src/kdevelop> make install
```

That's all. If you installed KDevelop in the default KDE directory you may now run the IDE. Otherwise some additional steps will be necessary as shown in the Non-default installation directory section below.

NOTE
In fact there usually will have been three KDevelop-based applications installed:

- The KDevelop IDE — this is the place where you will usually work.
- The stand-alone KDevelop Assistant documentation browser — isolates all the powerful documentation facilities of the KDevelop IDE in a separate tool. This comes in handy when you want to look up some programming documentation but do not want to start the full IDE.
- The KDevelop Designer — enhances the Qt^{TM} User Interface Designer by KDE specific elements and integrates nicely in the KDevelop IDE.

A.3.3 Some Notes on configure Options

A.3.3.1 Non-default Installation Directory

By default **configure** prepares the IDE to be installed in the default KDE directory. This is necessary because KDevelop assumes direct access to some tools and parts which reside there. If want to use your own installation directory, you must tell **configure** this by the `--prefix` option:

```
/kde3src/kdevelop> ./configure --prefix=(where-your-kde3-is)
```

There is a caveat if you do so. You must provide a means for KDevelop to access the needed tools and parts in the KDE directory when running. (You can still use the IDE without doing so, but with very restrained capabilities.)

Call up a shell and have the following commands executed before you start KDevelop at the shell prompt.

NOTE
Take care to use the plural: It is '`KDEDIRS`', not just '`KDEDIR`')

```
> export KDEDIRS=/usr/local/kde:/opt/kde3
> kbuildsycoca
```
(Now start KDevelop:)
```
> kdevelop
```

NOTE
The `KDEDIRS` environment variable must be set to the *list of active KDE directories* in your system. We use
`/usr/local/kde:/opt/kde3`
as an example only.
The `/usr/local/kde` directory may for instance contain an incomplete KDE version you compiled for debug purpose

In a tcsh shell you must set the environment variables using:

```
> setenv KDEDIRS /usr/local/kde:/opt/kde3
```

The **kbuildsycoca** command ('build system control cache') looks around for libraries and caches their location and version, so that KDevelop can find them. The caveat is that it takes noticeable time—and it has to be run any time you call up the shell to start KDevelop from a non-default directory. You may want to put the above commands into a shell script to reduce the typing effort.

(You could as well put the lines in your `.bashrc` or `.cshrc` file, but this is not advisable as **kbuildsycoca** will then be run any time you call up the shell.)

NOTE
The **kbuildsycoca** command does not run from within the root. You must call it from a non-root user. (But is *not a very good idea* after all to do software development from within the root!)

A.4 How to Obtain a KDevelop API Documentation

API is the short form of 'Application Program Interface'. Actually such an API cotains a series of descriptions (i.e. calling conventions) by which an application program can access the operating system and other services. In our context, however, a broader definition was adopted. The API of a KDE or Qt™ application is an abstract of the classes and methods interfaces, a synopsis to be used like a dictionary to navigate the sources.

There is a version of the most current API available at the KDevelop-Home website. It will be automatically updated every 24 hours so you can keep up.

Alas, this version is best used read-only over the internet. If you do not always have internet access you may as well build your own API documentation from the KDevelop sources. To do so, you must tell the automake system where to find the KDELIBS API in your system. This is accomplished by the special option `--with-kdelibsdoxy-dir` in the **configure** command when you prepare to compile the KDevelop sources:

```
  /kde3src/kdevelop> ./configure --(options-as-usual)\
 --with-kdelibsdoxy-dir=$KDEDIR/share/doc/HTML/en/kdelibs-apidocs
```

(**make** will replace the global `$KDEDIR` variable with the actual KDE directory setting recorded therein.) Then issue a **make** command as usual. After the KDevelop IDE has been built you have the option to build the API as well. For this you must issue

```
  /kde3src/kdevelop> make apidocs
```

This will build a `Doxyfile` in your KDevelop base directory which in turn will be processed by the Doxygen application to build quite a lot of `.html` API files. When this rather lengthy API building process (may last more than an hour on a slow system) finally comes to an end, you must install the API just like you have to install the KDevelop IDE itself. If necessary obtain superuser rights by

```
  /kde3src/kdevelop> su
```

and entering the root password. Then install the API files:

```
  /kde3src/kdevelop> make install-apidox
```

Once this is done, **make** will inform you about the directory where you can finally look at the API documentation's contents. Note this address, you can use it from Konqueror as well as from inside KDevelop, in case you have set up the KDevelop sources themselves as a project to work on.

NOTE
You will most probably see a lot of warning and/or error messages during the API build run by Doxygen. It is best to ignore them, they are of interest to the KDevelop developers only. If the API generation ever comes to a successful end, the `.html` API files will be usable.

Appendix B

In a Nutshell — Tips and Tricks

The information in this chapter is meant as a quick reference for a head start or if you (momentarily) forgot about some basic concept. There are also short hints on how to solve some common problems when working with KDevelop.

If you want more information on a topic, just follow the link in the title starting that advice.

Information on these topics is availabe:

Look and Feel

Force smaller tool view tabs in IDEAl Mode By default KDevelop starts with large text-based tool tip tabs around the work area. You may change this look to e.g. save space in the KDevelop configuration dialog (Settings → Configure KDevelop... → User Interface).

If you use an older KDevelop 3 version, this configuration dialog may not be available. To change the toolview tabs display manually, place a `MDIStyle` entry under the `[UI]` tag in your `$KDEHOME/share/config/kdeveloprc` configuration file as follows:

`MDIStyle=0`: icons only
`MDIStyle=1`: text only (default)
`MDIStyle=3`: icons and text

Weird colored characters and/or display style If you notice random colored letters everywhere (i.e. on tabs, on tool bars, etc.) and the KDevelop window seemingly uses a wrong display style, this may help:

- In your `$KDEHOME/share/config/kdeveloprc` configuration file find the line containing '`Style=Checked`' and remove it. Then restart KDevelop.

(This behaviour does sometimes occur after you left clicked a .ui file in one of the file navigators and KDevelop did load KUIViewer to show the GUI which was produced from this file.)

Full screen mode Select View → Full-Screen Mode from the menus or press Ctrl-Shift-F.

Hide/Unhide the menubar To hide the menubar select Settings → Show Menubar from the menus or press Ctrl-M. To redisplay the menubar only Ctrl-M is available.

PROJECTS

Create New Project Project → New Project... will start the Application Wizard.

Create a custom project There is no direct way to create a custom project (i.e. a project which does use its own makefiles). Use Project → Import Existing Project instead. Remember to set the appropriate Project Type, labeled by an additional '(Custom Makefiles)', in the dialog.

Use project options early Whenever you start a new project do not forget to set the Project → Project Options... to your needs.

COMPILATION

Missing detail in compilation messages If during compilations you notice some valuable information is missing in the Messages Output View window, it may be that the level of message detail is set too low. right mouse button click in the window and select another detail level from the context menu.

AUTOMAKE MANAGER

Create new files in a project Select the sub-project in the upper half of the Automake Manager, then right mouse button click in the lower half on the groups title you want to have the files added and select Create New File....

Add existing files to a project Select the sub-project in the upper half of the Automake Manager, then right mouse button click in the lower half on the groups title you want to have the files added and select Add Existing Files....

Remove a file from a project Select the sub-project in the upper half of the Automake Manager, then in the lower half open the groups list you want to have the file removed from, right mouse button click on the file in this list and select Remove.

Compile/Make Problems

Project does not build again after switching to/from default target There is a problem with the **automake**/**autoconf** machinery. If Project → Build Configuration provides to select from three build directories: default, optimized, and debug, by all means stick to *either* the default *or* the debug/optimized targets.

- Once you configured your project with default it will no longer build with debug or optimzed.
- Once you configured your project with debug or optimzed it will no longer build with default.

'Wrong autoconf version' etc. Error There are several error messages concerning too old versions of autoconf etc. prohibiting **configure** to work properly. Run **autoreconf** in the directory tree where the `configure.in` files in question are. This command will try to update the information in the GNU Build System files. See **man autoreconf** for more information.

Other Topics

Configuration Files used by KDevelop Usually you should not need to care, but this is very useful to know in case something went wrong with your setup.

Appendix C

Development on UNIX

C.1 Some Historical Remarks

From the beginning, UNIX® has maintained two very different development paradigms. One is the world of *system and application programming languages*, where some source code is translated to machine code by a translation program, usually a *compiler* or an *interpreter*. The programming language C is an example. UNIX® was the first operating system kernel to be written in such a high level language instead of tightly machine-oriented assembler which was common before that time. (In fact, the C language once even was invented to write the UNIX® kernel and associated programs on a DEC PDP-11 computer.)

The other paradigm is the world of *scripting languages*. This world evolved with the invention of the UNIX® shell which was the user's interface to the operating system—and at the same time a very high level programming language. A shell script is built from a set of small utility programs like e.g. **grep**, **sed**, or **find**. Each such utility is designed for some tightly defined job. The trick is that any such utility can be connected to another one via a simple transport mechanism, called a *pipe*, which directs the output of the foregoing utility into the input of the next processed one. This makes for a very powerful and highly flexible programming tool.

As time has gone by, both worlds have evolved. While C is still used mainly as a system programming language, C++ as a variant of C enriched by object-oriented and generic extensions has found its place for the development of complex applications in the 1990's. There are numerous other programming languages, even older ones keep their place—FORTRAN77 and Ada e.g. still have their stronghold in numerical applications.

C.2 Contemporary Scripting Languages

In the scripting area, there has been a shift away from the shell, which suffers from portability concerns, to languages which unify all commonly needed functionality in their standard libraries, while still being able to interface to the outside through pipes when necessary.

All these scripting languages have in common that they are widely portable between UNIX® variants, Microsoft Windows®, Mac® OS or even VMS. Also, they all have implementations that are freely distributable.

C.2.1 Perl

Perl has become popular as a text processing and system administration language. In the beginning of the World Wide Web, CGI scripts written in Perl were a widely used method to create dynamic web pages from databases. Today, this method has been replaced mostly by the **mod_perl** plugin for the Apache web server. Among Perl's strengths are its built-in support for advanced regular expression matching and its rich archive of freely distributed modules.

For more information see the Comprehensive Perl Archive Network (CPAN) website.

C.2.2 Python

Python shines by the elegance of its class system and the ease and flexibility with which external libraries can be wrapped in a way that they appear like standard Python classes and functions. In contrast to Perl, Python has a clear and concise embedding API, which makes it the language of choice for making C and C++ programs scriptable.

C.2.3 PHP

PHP was invented as a language directly embeddable into HTML pages and consequently has its main uses in delivering dynamic content on the web.

C.3 Higher-level Scripting

Higher-level UNIX® applications usually miss the speed and flexibility of the traditional character-oriented shell scripting mechanisms. This is especially true in the world of graphical user interfaces (GUI) such as e.g. KDE.

There have been attempts to provide similar mechanisms which will work on a higher application level, most notably CORBA and, in the KDE environment, DCOP.

C.3.1 The CORBA Protocol

CORBA (*Common Object Request Broker Architecture*) is an attempt to let computer applications work together over networks. It was devised by the private, vendor independent OMG (Object Management Group) standards comittee.

CORBA-based programs use the IIOP standard protocol to communicate. Implementations based on IIOP are available on a wide variety of operating systems, programming languages, and networks and are thus highly portable.

The main drawback of CORBA is its rather low speed. While this may be tolerable in networks, it is a real hindrance for inter-application communications in a non-networked environment such as KDE running on a single computer.

C.3.2 The DCOP Interface

Another evolution on UNIX®-like scripting is the DCOP protocol which was devised for communication between KDE applications to overcome the limitations of CORBA.

DCOP stands for *Desktop Communication Protocol* and is implemented as a simple IPC/RPC mechanism built to operate over sockets. In effect this provides facilities similar to the traditional UNIX® pipe mechanism.

Traditional shell scripting is based on fairly small tool programs which were designed to work on a strictly textual basis. DCOP allows elaborate graphical programs to communicate with each other in a quite similar way. This enables e.g. a KDE program to send messages to another KDE program, or receive data from it for its own purposes.

There are drawbacks, however. To use DCOP a program must be designed to contain a special DCOP interface. And the DCOP communication process runs somewhat slowly (although a lot faster than CORBA). But it returns much of the power and flexibility of UNIX® scripting to high-level programs which are based on a graphical user interface.

For more information, see the DCOP: Desktop COmmunications Protocol paper or The DCOP Desktop Communication Protocol library API reference of the KDE dcop library.

C.4 Build Systems

Except in very simple cases a programming project will consist of a lot of building blocks of source code each put into a separate file for easier maintenance. To make this running one has to effectively translate all this stuff into a few machine language units in a suiting format which allows the operating system to load and execute the program.

To accomplish this, the basic tools needed are

- a *text editor* to write the source code files,
- a translating program, usually a *compiler* to turn the source code into object files,
- a *librarian* which collects object files into libraries to reuse them easily without the need to recompile,
- a *linker* which binds several object files and libraries together into one executable,
- a *make system* which provides some means to manage all this stuff and—not to forget
- a *debugger* to (hopefully) find all errors in the program and possibly some other diagnostic tools to get everything running smoothly.

When you have a large project consisting of possibly hundreds of source code files, the process of compiling may become quite laborsome. You do not want to recompile all files each time you have changed only some of them. Instead, you only want to compile those files which are affected by the changes. In general, it is not always easily obvious which of the files have to be recompiled.

When you e.g. change a function prototype in a header file, you need to compile every file which includes this header file. If your project contains many such files you may easily miss one or two of them if you have to do the job manually. Thus some means of automization is necessary.

C.4.1 The Make Process

A tool which takes care of recompilations is **make**. It keeps track of all work using a set of *rules* which describe what to do in case some piece of information (usually a source or object code file) was changed. All rules belonging to a certain project are stored in a so-called `Makefile` which is processed by **make** any time you want to update your work.

Each rule consists of several building blocks, namely

- a *target*, i.e. the file to be built
- a set of *dependencies*, basically the names of those files the target depends on (e.g. the name of a source file, where then the target will be the name of the object file to be built) and
- the *commands* which are to be executed to 'make' the target (i.e. to compile it or to link other object files together to build an executable progam file).

Basically the **make** command will read the rules one after another, check each file in the dependency list of a given target and make this target anew if any one of these files has changed, using the commands listed in that rule.

There are several additional possibilities to control such a make process, and a `Makefile` can thus grow very complex. We cannot go into the details here. However, we recommend that you make yourself accustomed to the syntax of **make**. Even if you do not normally use it directly, an understanding of the fundamentals of the build system can be useful. See the GNU Make Manual for more information.

For more KDevelop specific detail see the Building and Project Management chapter of this manual.

There are several tutorials available, see the references in the Building and project management chapter.

C.5 GUI Development

Application developers become even more encumbered by having not only to create program libraries and logic, but also to provide an easy to use custom built user interface that is both intuitive and functional. Most programmers receive little to no training in GUI development, and as a result user interfaces often are poorly designed.

During the years some common design principles have evolved. It is strongly advised to adhere to them. This way your user interfaces will retain a common look and feel that the users of your application will gratefully appreciate.

For KDE GUI development there is a style guide available. It is found in the KDE User Interface Guidelines on the KDE Developer's Corner page.

A short introduction to common GUI design principles can be found here.

C.6 Integrating Concepts and Tools – the IDE

There are separate tools available for almost any step in the programming process—planning, editing, managing files and compilation processes, debugging, documentation and the like. But once the projects grow the programming processes will most likely become quite cumbersome.

Much repetitive work has to be done when designing, compiling, and debugging a program. A lot of such work can be saved through the use of templates and scripts. And another lot by keeping these tools easily available and able to communicate with each other under a common GUI.

For example—would it not be convenient if a debugger were able to open the source file in question in an editor and place the cursor directly at the position of that bug just found?

To more easily accomplish such a scheme, *Integrated Development Environments* (IDEs) were devised. Such an IDE integrates all templates, tools, and scripts which are commonly needed in the development process into one single environment.

For the KDE platform KDevelop is such an IDE. It provides a wide range of tools which ease program development and maintenance, even for different programming languages and across platforms.

C.6.1 Basic Features of KDevelop 3.3.91

- Manages all *development tools* needed for C++ programming, such as compiler, linker, debugger and build system.
- Provides an *Application Wizard* which generates complete, ready-to-go sample applications.
- Allows the user to select an *integrated editor* based on the KDE programmer's editor KWrite, Trolltec's QEditor, or others.
- A *class generator*, for creating new classes and integrating them into the current project.
- *File management* for sources, headers, documentation etc. to be included in the project.
- Assistance in *creating application user manuals* written with KDE tools.
- Automatic HTML based *API documentation* for a project's classes with cross-references to the used libraries.
- *Internationalization support*, allowing translators to add their target language to a project easily, including support for KBabel.
- Support for managing a project via one of several *versioning systems* (e.g. CVS) by providing an easy-to-use frontend for the most needed functions.
- An integrated *debugger* frontend.
- An integrated *shell console* emulator.
- *Syntax highlighting* in source texts.
- An *auto-code completion* facility for class variables, class methods, function arguments and more.
- *Templates for creating various projects* (KControl modules, Kicker (panel) applets, KIOSlaves, Konqueror plugins and desktop styles).
- Four *navigation tree views* for easily switching between source files, header files, classes and documentation, obviating the need for an external file manager.
- *Cross-compiling support*, with the ability to specify different compilers, compiler flags, target architecture, etc.
- Support for *Qt/Embedded projects* (such as the Zaurus and iPAQ).
- *Inclusion of any other program* you need for development by adding it to the Tools menu according to your individual needs.

Appendix D

Configuration Files Used by KDevelop

KDevelop uses a series of configuration files which are distributed amongst several directories. There are two main groups of configuration files to distinguish:

KDevelop Default Configuration — files set up when KDevelop was installed.
User Oriented Configuration — files which contain user modifications of the defaults as well as settings ma

D.1 KDevelop Default Configuration

On installation, KDevelop writes some default information files for setup and configuration purposes into subdirectories of the `$KDEDIR` installation directory (usually something like `/opt/kde`, `/usr/local/kde`, or some other user-defined installation directory, see Installing KDevelop).

D.1.1 Default KDevelop Configuration

There is only one KDevelop specific default configuration file in the `$KDEDIR/share/config/` directory:

`kdeveloprc` This file contains the basic settings KDevelop needs to start. It will be copied to the user's `$KDEHOME/share/config` directory when KDevelop does not find a `kdeveloprc` file there on startup.

D.1.2 Application Specific Defaults

Most KDevelop features are provided by KParts. These are basically applications specially designed to run in the KDevelop framework (see the overview in the Plugin Tools appendix). Each KPart application has its own set of configuration files whose defaults will be stored in several subdirectories of the `$KDEDIR/share/apps/` installation directory.

There are quite a lot of default configuration subdirectories in `$KDEDIR/share/apps/` whose names all start with a `kdev` sequence. Most of them are for KDevelop internal use only. They might be deliberately grouped for readability as:

Stand-alone Applications
Task Specific Parts
Project Generation Parts
Language Specific Parts

- STAND-ALONE APPLICATIONS
  - `kdevelop/` — contains files to configure the KDevelop IDE:
    - `licenses/` — contains various licenses texts.
    - `pics/` — contains the picture files used for the KDevelop, KDevelop Assistant, and KDevelop Designer splash screens.
    - `profiles/` — contains default plugin profile settings. (Currently there is only a `tiny` profile provided which defines a minimum set of active KDevelop plugins.)
    - `eventsrc` — holds a lot of 'Process successful' localization strings.
    - `kdevelopui.rc` — provides the basic menu and tool bar entries KDevelop uses.
    - `kdevhtml_partui.rc` — provides a Print... entry in the File menu, a Copy entry in the Edit menu, and Back and Forward arrows in the Browser Toolbar in case a HTML file is browsed from the Documentation plugin.
  - `kdevassistant/` — provides the menu and tool bars of the stand-alone KDevelop Assistant documentation browser.
  - `kdevdesigner/` and `kdevdesignerpart/` — provide menu bar and tool bars of the stand-alone KDevelop user interface designer.
- TASK SPECIFIC PARTS
  - `kdevabbrev/` — contains files used by the Abbreviation Expansion plugin:
    - `sources/` — contains keyword definition files used by the Expand Text command.
    - `templates/` — contains template definition files used by the Expand Abbreviation command.
    - `kdevabbrev.rc` — provides the Expand Text and Expand Abbreviation entries in the Edit menu.
  - `kdevappwizard/` — contains files used by the Application Wizard part:

  * `importfiles/` — contains `.kdevelop` project files which control the initialization of a new project.
  * `imports/` — contains templates to set up project specific `.desktop` files.
  * `template-common/` — contains various files commonly included in the project source directories.
  * `templates/` — contains configuration files which describe the information to be included in a given project source directory.
  * `*.png` — project preview images used by the Application Wizard.
  * `*.tar.gz` — tarballs containing the source files to be included in a new generated project directory.
- `kdevastyle/` — provides the Reformat Source entry in the Edit menu.
- `kdevautoproject/` — provides most of the entries in the Build menu and the Build Toolbar (KDevelop) toolbar.
- `kdevclassview/` — contains files used by the Class View project plugin:
  * `pics/` — contains the icons used in the Classes classview tree.
  * `kdevclassview.tc` — provides the Class Inheritance Diagram entry in the Projects menu as well as the classes navigation combo box in the Browser Toolbar.
- `kdevcloser/` — provides the Windows menu close entries.
- `kdevctags/` — provides the CTags entry in the Tools menu for the CTags Frontend project plugin.
- `kdevcvsservice/` — provides the icon used by the CvsService tab and a short shell script used to add a new entry to the CVS repository, both used by the CVS Integration project plugin.
- `kdevdebugger/` — provides the Debug menu entries for the Debugger Frontend project plugin.
- `kdevdiff/` — provides the Difference Viewer entry in the Tools menu.
- `kdevdistpart/` — provides the Distribution & Publishing entry in the Project menu for the Final Packaging Support project plugin.
- `kdevdocumentation/` — contains files used by the Documentation plugin:
  * `en/` and `pics/` — contain files used by the htdig search tool.
  * `tocs/` — contain the default KDevelop documentation content description files (see the description in Basic Structure of KDevelop TOC Files).
  * `kdevpart_documentation.rc` — provides the search related entries in the Help menu.
- `kdevdoxygen/` — provides the menu entries for the Doxygen Support project plugin.
- `kdevfilecreate/` — contains files used by the New File Wizard:
  * `file-templates/` — provides the initial text contents to be put into the new source file of a given type.
  * `kdevpart_filecreate.rc` — provides the New entry in the File menu.
  * `template-info.xml` — contains descriptions of the available file types to be displayed in the New File tool view.

- `kdevfilter/` — provides the Execute Command... and Filter Selection Through Command... entries in the Tools menu used by the Shell Filtering and Insertion plugin.
- `kdevfullscreen/` — provides the Full Screen Mode entry in the View menu and the according tool bar icon.
- `kdevgrepview/` — provides the Find in Files...entry in the Edit menu used by the Grep Frontend plugin.
- `kdevhistory/` — provides the Back and Forward entries in the View menu.
- `kdevjavadebugger/` — provides a Java Debug menu in order to debug a Java™ application.
- `kdevoutputviews/` — provides the Next Error and Previous Error entries in the View menu.
- `kdevpartexplorer/` — provides the Part Explorer entry in the Tools menu used by the Part Explorer Tool plugin.
- `kdevquickopen/` — provides the Quick Open File.. entry in the File menu and the Quick Open Class... and Quick Open Method entries in the Tools menu used by the Quick Open project plugin.
- `kdevregexptest/` — provides the Debug Regular Expression... entry in the Tools menu used by the Regular Expression Tester plugin.
- `kdevreplace/` — provides the Find-Select-Replace... entry in the Edit menu used by the Replace Part plugin.
- `kdevtipofday/` — provides the Tip of the Day entry in the Help menu as well as a HTML-File containing the available tips.
- `kdevtools/` — controls various menu entries ceated by Tools Menu and External Tools Menu settings provided by the Tools Menu Addition plugin.
- `kdevvalgrind/` — provides the Valgrind Memory Leak Check and Profile with KCachegrind entries in the Debug menu used by the Valgrind Frontend plugin.

- PROJECT GENERATION PARTS
  - `kdevadaproject/` — provides entries for the Build menu and according tool bar icons to build an Ada application.
  - `kdevantproject/` — provides entries for the Build menu when the Ant project generator is used.
  - `kdevautoproject/` — provides entries for the Build menu and according tool bar icons when working with the GNU Tools based **automake** project generator. Additionally provides the Add Translation and Build Configuration entries to the Project menu.
  - `kdevcustomproject/` — provides entries for the Build menu and according tool bar icons when the project is based on custom Makefils.
  - `kdevgenericproject/` — contains menu definitions for an experimental generic project generator. Currently (version 3.1.0) unused.

- `kdevhaskellproject/` — provides entries for the Build menu and according tool bar icons to build a Haskell application.
- `kdevpascalproject/` — provides entries for the Build menu and according tool bar icons to build a Pascal application.
- `kdevtrollproject/` — provides entries for the Build menu and according tool bar icons to build an application using the Qt™ QMake project manager.

• LANGUAGE SPECIFIC PARTS

- `kdevadasupport/` — provides entries in the Tools menu and according tool bar icons needed to develop Ada applications.
- `kdevbashsupport/` — provides entries in the Build menu and according tool bar icons needed to develop Bash scripts.
- `kdevcppsupport/` — contains files used by the Application Wizard to build C++ applications:
  * `newclass/` — contains header and source templates from which the Application Wizard builds the according source files.
  * `subclassing/` — contains templates which the Application Wizard uses to set up initial class declarations/definitions in the source files.
  * `templates` — contains templates from which the Application Wizard sets up the default header and source template files to be used by the New File Wizard.
  * `configuration` — dummy template to add macros.
  * `kdevcppsupport.rc` — provides the Complete Text and Make Member entries fo the Edit menu, the Switch Header/Implementation entry for the View menu, and the New Class entry for the Project menu as well as a New Class icon for the Browser Toolbar.
- `kdevfortransupport/` — provides entries in the Build menu needed to develop Fortran applications.
- `kdevhaskellsupport/` — provides entries in the Build menu and according tool bar icons needed to develop Haskell applications.
- `kdevjavasupport/` — contains the UI definition needed to develop Java™ applications.
- `kdevpascalsupport/` — contains the UI definition needed to develop Pascal applications.
- `kdevperlsupport/` — provides Project and Help menu entries needed to develop Perl scripts.
- `kdevphpsupport/` — contains UI and PHP function definition files needed to develop PHP scripts.
- `kdevpythonsupport/` — provides Build and Help menu entries and according tool bar icons needed to develop Python scripts.
- `kdevrubysupport/` — provides Build menu entries and according tool bar icons needed to develop Ruby scripts.
- `kdevscriptproject/` — provides th UI definitions needed to develop custom projects. Currently (version 3.1.0) unused.
- `kdevsqlsupport/` — provides th UI definitions needed to develop SQL projects. Currently (version 3.1.0) unused.

D.2 User Oriented Configuration

All information about user defined settings is kept in two subdirectories of `$KDEHOME`, namely:

Application Specific Configuration in the `$KDEHOME/share/apps/` directory, and
Resource Configuration File in the `$KDEHOME/share/config/` directory.

D.2.1 Application Specific Configuration

Any user changes to the KDevelop Default Configuration settings as well as user specific settings which are not kept in any of the Resource Configuration Files are found in `kdev...` subdirectories of the `$KDEHOME/share/apps/` directory.

Most of these configuration files are however used by various KDevelop plugins in order to provide some specific menu and/or toolbar entries. Thus they are of interest only in case something went really wrong with the user interface.

> NOTE
> In case the contents of these directories mirror those of the Default Configuration settings, KDevelop will have copied them from `$KDEDIR/apps/` into the `$KDEHOME/apps/` directory on its initial start. Any subsequent changes will be made to these copies only. The Default Configuration settings remain unchanged in any case.

- `kdevabbrev/` — contains files used by the Abbreviation Expansion plugin:
  - `sources/` — currently empty; KDevelop uses the default keyword definition files for Expand Text commands.
  - `templates/` — contains the user modified template definition files used by the Expand Abbreviation command.
  - `kdevabbrev.rc` — provides the Expand Text and Expand Abbreviation entries in the Edit menu.
- `kdevappwizard/` — only provides the New Project... and Import Existing Project... entries in the Projects menu. The Application Wizard will use the default configuration settings for its actual works.
- `kdevastyle/` — provides the actual Reformat Source entry in the Edit menu.
- `kdevautoproject/` — provides the actual entries in the Build menu and the Build Toolbar (KDevelop) toolbar.
- `kdevclassview/` — provides the Class Inheritance Diagram entry in the Project menu and the class browser combo box in the Browser Toolbar by the Class View project plugin.

- `kdevcloser/` — provides the Close Selected Windows... entry in the Windows menu.
- `kdevcppsupport/` — holds the acual configuration used by the Application Wizard to build C++ applications. The Application Wizard however uses its main bulk of configuration information directly from the default configuration directory. See there for more detail.
  - `newclass/` — contains the actual header and source templates from which the Application Wizard builds the according source files.
  - `pcs/` — contains database files KDevelop uses build the actual Persistent Code Store (`.pcs`) file of a KDE C++ project.
  - `kdevcppsupport.rc` — provides the Complete Text and Make Member entries fo the Edit menu, the Switch Header/Implementation entry for the View menu, and the New Class entry for the Project menu as well as a New Class icon for the Browser Toolbar.
- `kdevctags/` — provides the CTags entry in the Tools menu for the CTags Frontend project plugin.
- `kdevdebugger/` — provides the Debug menu entries for the Debugger Frontend project plugin.
- `kdevdiff/` — provides the Difference Viewer entry in the Tools menu.
- `kdevdocumentation/` — contains the actual files used by the Documentation plugin in addition to the default configuration files. See there for more detail.

  The directories in `kdevdocumentation/` mainly hold actual bookkeeping information. The actually set up documentation files are kept in doc...pluginrc files in the `$KDEHOME/share/config/` directory.
  - `bookmarks/` — maintains the entries in the Bookmarks tab of the KDevelop Documentation plugin.
  - `index/` — holds various cache files KDevelop uses to speed up indexed documentation searches in the Index tab of the Documentation plugin.
  - `search/` — contains files used by the htdig search tool which serves search calls from the Search tab of the Documentation plugin.
  - `kdevpart_documentation.rc` — provides the search related entries in the Help menu.
- `kdevdoxygen/` — provides the menu entries for the Doxygen Support project plugin.
- `kdevelop/` — contains some actual settings KDevelop uses for its basic setup:
  - `profiles/` — provides actual plugin profile setting. (Initially there is only a `FullIDE` profile which defines a full set of initially active KDevelop plugins.)
  - `kdevelopui.rc` — provides the basic menu and tool bar entries KDevelop uses.

- `kdevfilecreate/` — contains files used by the New File Wizard:
  - `file-templates/` — provides the actually used text contents to be put into the new source file of a given type. More file templates are found in the default configuration files directory.
  - `kdevpart_filecreate.rc` — provides the New entry in the File menu.
  - `template-info.xml` — contains descriptions of the available file types to be displayed in the New File tool view.
- `kdevfilter/` — provides the Execute Command... and Filter Selection Through Command... entries in the Tools menu used by the Shell Filtering and Insertion plugin.
- `kdevfullscreen/` — provides the Full Screen Mode entry in the View menu and the according tool bar icon.
- `kdevgrepview/` — provides the Find in Files...entry in the Edit menu used by the Grep Frontend plugin.
- `kdevoutputviews/` — provides the Next Error and Previous Error entries in the View menu.
- `kdevpartexplorer/` — provides the Part Explorer entry in the Tools menu used by the Part Explorer Tool plugin.
- `kdevquickopen/` — provides the Quick Open File.. entry in the File menu and the Quick Open Class... and Quick Open Method entries in the Tools menu used by the Quick Open project plugin.
- `kdevregexptest/` — provides the Debug Regular Expression... entry in the Tools menu used by the Regular Expression Tester plugin.
- `kdevreplace/` — provides the Find-Select-Replace... entry in the Edit menu used by the Replace Part plugin.
- `kdevtipofday/` —provides the Tip of the Day entry in the Help menu. The HTML-File containing the available tips is provided as a default configuration file only.
- `kdevtools/` — controls various menu entries ceated by Tools Menu and External Tools Menu settings provided by the Tools Menu Addition plugin.
- `kdevvalgrind/` — provides the Valgrind Memory Leak Check and Profile with KCachegrind entries in the Debug menu used by the Valgrind Frontend plugin.

D.2.2 Resource Configuration Files

There are two groups of KDevelop configuration files in the `$KDEHOME/share/config/` directory, distiguished by their surrounding character sequences:

'`doc...pluginrc`' denotes files used by the documentation plugin.
'`kdev...rc`' denotes configuration files used by KDevelop itself and its available plugins.

CONFIGURATION FILES USED BY KDEVELOP

- `kdevabbrevrc` — holds the current state of the Abbreviations configuration provided by the Abbreviation Expansion plugin.

> NOTE
> This only records whether the abbreviations will be used or not. The actual definitions of new abbreviations will go into the `$KDEHOME/share/apps/kdevabbrev/templates/templates` file.

- `kdevassistantrc` — holds some configuration states specific of the stand-alone KDevelop Assistant documentation browser.

> NOTE
> Most common configuration settings are shared with the KDevelop IDE `kdeveloprc` file.

- `kdevassistantuimode4rc` — holds the current MDI configuration states (dock positions etc.) of the stand-alone KDevelop Assistant documentation browser.
- `kdevclassviewrc` — holds the View Mode setting of the Classes class browser tab provided by the Class View project plugin.

> NOTE
> This is a global setting, although the Class View plugin may be disabled on a per project basis. Any change in this setting will be globally updated whenever the current project is closed and thus affect all subsequently loaded projects.

- `kdevcppsupportrc` — holds some settings used to set up CPP source files. In particular you will find the settings made on the C++ Class Generator configuration dialog in here.
- `kdevdocumentationrc` — holds actual settings the Documentation plugin uses.
- `kdeveloprc` — holds the global settings the KDevelop IDE and the KDevelop Assistant stand-alone documentation browser will use.
- `kdevelopuimode4rc` — holds the current MDI configuration states (dock positions etc.) of the KDevelop IDE.
- `kdevfileselectorrc` — holds actual settings the File Selector plugin uses.
- `kdevfileviewrc` — holds the actual filename color settings the CVS Integration (Cervisia) project plugin uses for display.
- `kdevfilterrc` — holds actual settings the Shell Filtering and Insertion plugin uses.

- `kdevgrepviewrc` — holds actual settings the Grep Frontend plugin uses.
- `kdevsnippetrc` — holds actual settings the Code Snippets plugin uses.
- `kdevtoolsrc` — holds actual settings the Tools Menu Addition plugin uses.

CONFIGURATION FILES USED BY THE DOCUMENTATION PLUGIN

- `docchmpluginrc` — holds information about the actual Microsoft® CHM help files as defined on the CHM Documentation Collection configuration page.
- `doccustompluginrc` — holds information about any custom documentation file defined on the Custom Documentation Collection configuration page.
- `docdevhelppluginrc` — holds information about the actual GNOME 2 DevHelp documentation files as defined on the Devhelp Documentation Collection configuration page.
- `docdoxygenpluginrc` — holds information about the actual Doxygen generated API documentations as defined on the Doxygen Documentation Collection configuration page.
- `dockdevtocpluginrc` — holds information about the actual KDevelopTOC structured documentation files as defined on the KDevelopTOC Documentation Collection configuration page.
- `docqtpluginrc` — holds information about the QT documentation files actually included on the Documentation CollectionQt configuration page.

D.3 Project Dependent Configuration

Most project dependend configuration is kept in the `<project-name>.kdevelop` and `<project-name>.kdevses` KDevelop project configuration files rather than in separate files as the other, more global, configuration settings. In short, those files are meant for:

`<project-name>.kdevelop` — global project configuration information.
`<project-name>.kdevses` — configuration information needed to restore the specific behaviours of the runn

Both are XML^{TM} coded files. They can be viewed and (cautiously) altered using any text editor.

D.3.1 Persistent Code Store Files

There is a third project dependend configuration file, the `<project-name>.kdevelop.pcs` Persistant Code Store. This is a binary coded file holding an internal parser cache for the most part in order to speed up the loading sequence of the project. Additionally, this Persistant Code Store keeps information use by the Code Completion facility of KDevelop.

NOTE

There can be additional Persistant Code Store files be set up on the Code Completion tab of the C++ Specific project configuration page. Information about these additional `.pcs` is kept globally in the `$KDEHOME/share/apps/kdevcppsupport/pcs/` directory.

Appendix E

Plugin Tools

KDevelop contains a large number of little tools that help you to perform certain task. Most of them are realized as plugins. That means, if you do not need a plugin, you can disable it.

That also means, if you are looking for a functionality that should be there and isn't, then maybe it's implemented in a plugin and that plugin is disabled. For example, in the file menu there is a Quick Open feature, but only if it's enabled in the Project - Project Options dialog.

Technically, plugins are based on the KDevPlugin class defined in lib/interfaces/kdevplugin.h. The following is taken from a comment from there.

KDevPlugin is the base class for all KDevelop plugins. A plugin is a component which is loaded into KDevelop shell at startup or by request. A plugin has a scope that can be either:

- Core
- Global
- Project

Core plugins are global plugins which offer some important "core" functionality and thus are not selectable by user in plugin configuration pages.

Global plugins are plugins which require only shell to be loaded and do not operate on KDevProject interface and/or do not use project wide information. For example, the uimode plugin allows a developer to select which user interface they wish to use.

Project plugins require a project to be loaded and are usually loaded/unloaded along with the project. If a plugin operates on project-related information then it is a project plugin. The Automake Manager, for example, only needs to be active when an Automake based project is currently loaded.

As stated above, core plugins cannot be disabled. Global plugins can be enabled/disabled in Settings → Configure KDevelop... under Plugins. Project plugins can be enabled/disabled in Project → Project Options... under Plugins. Active plugins can have many effects on KDevelop. Depending on their function, they may add extra menus, extra menu items, extra tool buttons, etc.

Plugins which are disabled do not clutter your menus and are not loaded into memory.

The following plugin list is generated by a small script (listplugins.sh) written by Volker Paul. All plugins have a .desktop file where information such as name and comments are written. If in the following these comments are not very useful, it is because the plugin authors made them this way.

The plugins are grouped by scope (Core, Global, Project).

Scope: Core

- **Application Wizard** Application Wizard
- **Difference Viewer** Difference Viewer
- **FileCreate** FileCreate
- **FullScreen** FullScreen
- **Tip of the Day** Tip of the Day
- **User-Interface Selection** Provides a dialog for UI-mode selection.
- **VCSManager** Version Control System Manager

Scope: Global

- **Abbreviation Expansion** Provides support for customizable abbreviations - short words which expand into commonly needed code structures.
- **Documentation** The Documentation plugin offers browsing and searching in local and online documentation with support for multiple documentation systems.
- **FileList** Provides a list of all currently open files. (Handy when the tab bar is not quite wide enough.)
- **File Selector** Powerful network transparent file browser utility.
- **Shell Filtering and Insertion** Provides a way of manipulating editor text using commandline tools. Appears in the Tools menu.
- **Grep Frontend** Integrates "find | grep" in KDevelop - allows fast searching of multiple files using patterns or regular expressions.
- **Embedded Konsole** This plugin gives KDevelop an embedded konsole for quick and easy command line access.

- **"Open with" Menu Addon** This plugin provides additional "open" alternatives for various context menus in KDevelop.
- **Part Explorer Tool** A Graphical tool for performing KTrader-like queries about registered services
- **Regular Expression Tester** Tool to design and test regular expressions against common regexp syntaxes.
- **Replace Part** This plugin is an interactive projectwide "Search and Replace" tool. Search using string or regexp matching, and select the replacements to be made from a preview before the action is finalized. When loaded it appears in the Edit menu.
- **Scripting** The Scripting plugin offers KScript based scripting of the KDevelop application
- **Code Snippets** This plugin allows you to store code snippets and add them to your code
- **Text Structure** Provides a structure overview and navigation for HTML and TEX files
- **Tools Menu Addition** This plugin provides an easy way to add external applications to the Tools menu and toolbar.
- **Valgrind Frontend** Valgrind is a tool that helps you find memory management problems in programs. http://developer.kde.org/ sewardj/

Scope: Project

- **annotation Plugin** annotation Description
- **Source Code Formatter** A plugin for formatting of sourcecode according to a specified set of rules. When loaded it is found in the Tools menu.
- **Bookmarks** Plugin that provides navigation and overview of active source bookmarks and persists them between sessions.
- **Class View** This plugin displays a graphical view of all the classes in the project, complete with methods and attributes, and provides a way of direct source navigation.
- **CopyTo** Simple file uploader plugin. It does a file copy over any KIO supported protocol.
- **CTags Frontend** CTags is a source navigation tool with support for many languages. When loaded it provides a context menu for finding type declarations/definitions and also a query dialog. http://ctags.sourceforge.net/
- **Final Packaging Support** Aids in building and publishing the final project. Only RPM package format is supported for now.

- **Doxygen Support** The doxygen plugin provides a way to specify and control generation of documentation for a project, based on source code content. You need to have doxygen installed to be able to use this. For more info goto http://www.doxygen.org
- **QuickOpen** Provides an efficient way of finding/opening files, classes and methods in a large project. Appears in the File and Tools menus when loaded.
- **Security Checker** Code security checker

So far the generated plugin list.

antproject	ANT Project Manager (Java^{TM} applications)
autoproject	Automake Project Manager
customproject	Custom Project Manager
trollproject	QMake based Project Manager

Table E.2: Project Management Plugins in KDevelop

The above plugins are currently (May 2005) empty. Maybe project management support will be implemented as plugins in the future.

cppsupport	Support for C/C++
fortransupport	Support for Fortran
javasupport	Support for Java^{TM}
perlsupport	Support for Perl
phpsupport	Support for PHP
pythonsupport	Support for Python

Table E.4: Language Support Plugins in KDevelop

In the following, some of the plugins will be discussed in detail.

- **The abbrev Plugin** This plugin expands abbreviations into frequently used code snippets. It is activated by pressing Ctrl-Space. For example, when you enter `"ife"` into a C++ in the editor and press Ctrl-Space, you obtain an `if-else` code template and save some key strokes. The set of supported abbreviations depends on the programming language of the edited file. For example, for PHP you will obviously be interested in other code templates than for Java^{TM}.

The set of code templates is configurable. If the plugin is enabled, you can see which ones are available in the Settings → Configure KDevelop... dialog under Abbreviations.

- **The filter Plugin** This offers two features. If you select Tools → Execute command, you can enter a shell command. The output of this command is inserted into the editor buffer when you hit the Start button.

  A related feature is available under Tools → Filter selection through command.... In order to use this, you must select a text area in the editor. If you now enter a shell command and hit the Start button, the command is started and the selection used as the standard input for it. The standard output of the command is then inserted into the editor, replacing the selection.

  For example, if you write documentation, you frequently have to refer to menu items. To do this correctly for e.g. the Copy command in the Edit menu, you have to write:

  ```
  <menuchoice><guimenu>Edit</guimenu><guimenuitem>Copy</ ↩
      guimenuitem></menuchoice>
  ```

  This is cumbersome, so you'd rather just write "Edit - Copy" and let the computer do the tagging. Here is how you can do it. You write a little shell script called mef you put e.g. in your home's bin directory:

  ```
  sed s/"^\(.*\) - \(.*\)\$"/"<menuchoice><guimenu>\1<\/ ↩
      guimenu><guimenuitem>\2<\/guimenuitem><\/menuchoice>"/
  ```

  Don't forget to make it executable. That's all. Now, in your documentation .docbook source, you write "Edit - Copy". You select this text you just wrote, choose Tools → Filter selection through command... and call /bin/mef. Instantly "Edit - Copy" is replaced by

  ```
  <menuchoice><guimenu>Edit</guimenu><guimenuitem>Copy</ ↩
      guimenuitem></menuchoice>
  ```

- **The Doxygen Plugin** This one helps you to use the Doxygen API documentation tool (`http://www.doxygen.org`). You can select Project → Run Doxygen to generate API documentation for your current project, based on the configuration given by the file `Doxyfile` in your project directory.

  Furthermore, you can configure Doxygen in the Project → Project options... dialog. This dialog is very similar to the doxywizard tool.

- **The ctags Plugin** Although the class browser gives you extensive insight into the symbols and classes of your project, you may also want to use the ctags tool. In particular, this one supports a lot more language than the class browser.
  You activate this plugin under Tools → CTags.... When you start it the first time, you will be asked to generate a search database first. When you accept this, the **ctags** program will be started and will create a file named `tags` in your project directory. This is a text file containing all symbols of your source files.

You can search in the symbol database in two ways: when the Regular expression match box is checked, the text you enter will be interpreted as a regular expression (POSIX flavor) and matched with the existing symbols. For example, the text `.*Widget` will search for all symbols ending with `Widget`. If the box is not checked, the search will be verbatim.

When searching, you will get a list of the matched symbols, accompanied with the line numbers where they are defined. You jump to the respective point by clicking on the list.

For some languages, **ctags** distinguishes different kinds of symbols. For example, Python has classes and functions. You can selectively search only for classes by checking the respecting kinds in the dialog.

The symbol database is normally not updated when your sources change. Consequently, after a while the line numbers will not be correct anymore and newly added classes and functions will be missing. Therefore you should update the `tags` file in regular intervals by pressing the button Regenerate.

- **The astyle Plugin** Astyle is a plugin for formatting of sourcecode according to a specified set of rules.

- **The regexptest Plugin** Designing with regular expressions can be hard work. Often the first try at an expression matches too many strings. In particular, when working with a compiled language, the turnaround times when debugging a regular expression can be awkward. The regexptest plugin allows you to directly explore the changes in a regular expression. It is activated by choosing Tools → Debug Regular Expression....

  In the flavor group box, you can choose the flavor of the regular expression engine used. Currently supported is the flavor defined in the POSIX standard, which is used by the **grep** program, and the extended POSIX syntax used by the program **egrep**.

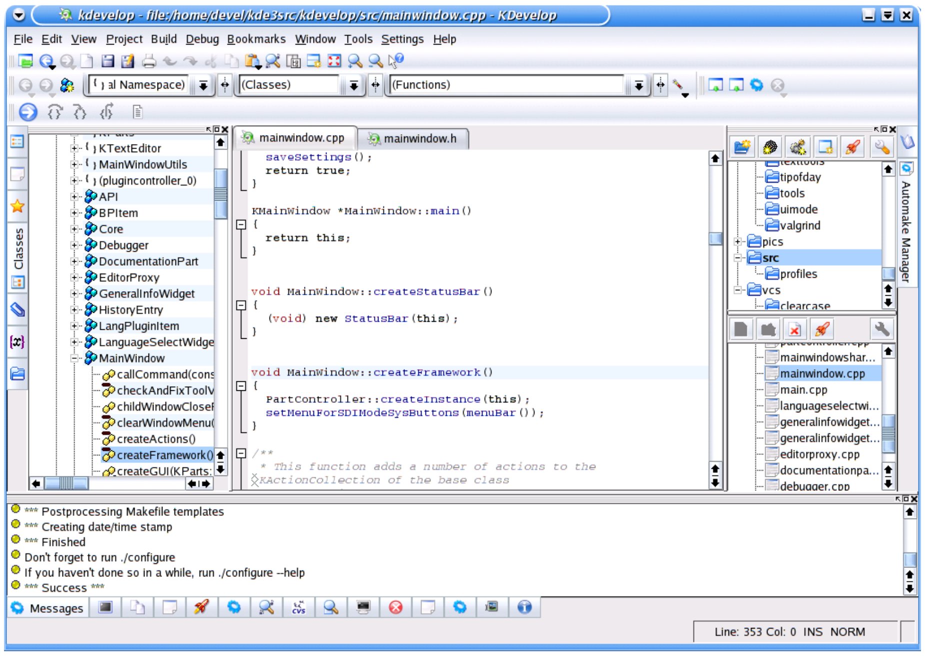
  When you enter an expression, you get immediate feedback about any syntax errors in it. By entering a text under Test string, you can see whether the expression matches this string. In particular, if your regular expression includes groups, such as `([a-z])`, the content of the matched subgroups will be shown in a list box.

Appendix F

KDevelop User Interface Mode Examples

F.1 IDEAl Mode

Click here to return to the modes overview.

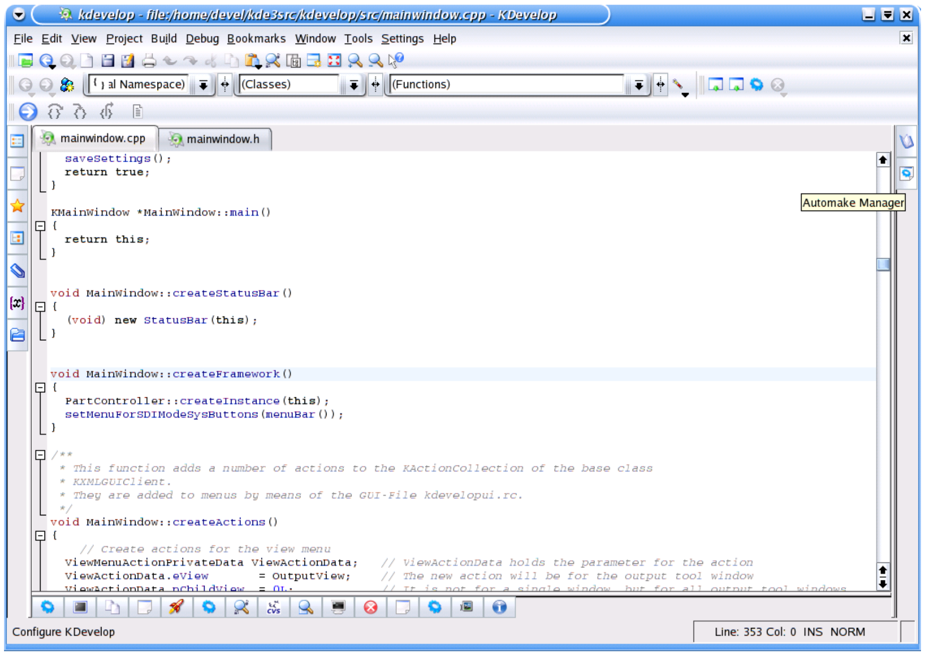

kdevelop - file:/home/devel/kde3src/kdevelop/src/mainwindow.cpp - KDevelop
File Edit View Project Build Debug Bookmarks Window Tools Settings Help
(Classes)
(Functions)
mainwindow.cpp
mainwindow.h
Classes
Automake Manager
Messages
Line: 353 Col: 0 INS NORM

```
  saveSettings();
  return true;
}

KMainWindow *MainWindow::main()
{
  return this;
}


void MainWindow::createStatusBar()
{
  (void) new StatusBar(this);
}


void MainWindow::createFramework()
{
  PartController::createInstance(this);
  setMenuForSDIModeSysButtons(menuBar());
}

/**
 * This function adds a number of actions to the
KActionCollection of the base class
```

```
*** Postprocessing Makefile templates
*** Creating date/time stamp
*** Finished
Don't forget to run ./configure
If you haven't done so in a while, run ./configure --help
*** Success ***
```

KDevelop IDEAl mode

Click here to return to the modes overview.


kdevelop - file:/home/devel/kde3src/kdevelop/src/mainwindow.cpp - KDevelop
File Edit View Project Build Debug Bookmarks Window Tools Settings Help
al Namespace)
(Classes)
(Functions)
mainwindow.cpp
mainwindow.h
Automake Manager
Configure KDevelop
Line: 353 Col: 0 INS NORM

```
  saveSettings();
  return true;
}

KMainWindow *MainWindow::main()
{
  return this;
}


void MainWindow::createStatusBar()
{
  (void) new StatusBar(this);
}


void MainWindow::createFramework()
{
  PartController::createInstance(this);
  setMenuForSDIModeSysButtons(menuBar());
}

/**
 * This function adds a number of actions to the KActionCollection of the base class
 * KXMLGUIClient.
 * They are added to menus by means of the GUI-File kdevelopui.rc.
 */
void MainWindow::createActions()
{
    // Create actions for the view menu
  ViewMenuActionPrivateData ViewActionData;   // ViewActionData holds the parameter for the action
  ViewActionData.eView       = OutputView;    // The new action will be for the output tool window
  ViewActionData.pChildView  = 0L;            // It is not for a single window, but for all output tool windows
```

KDevelop IDEAl mode, closed tabs

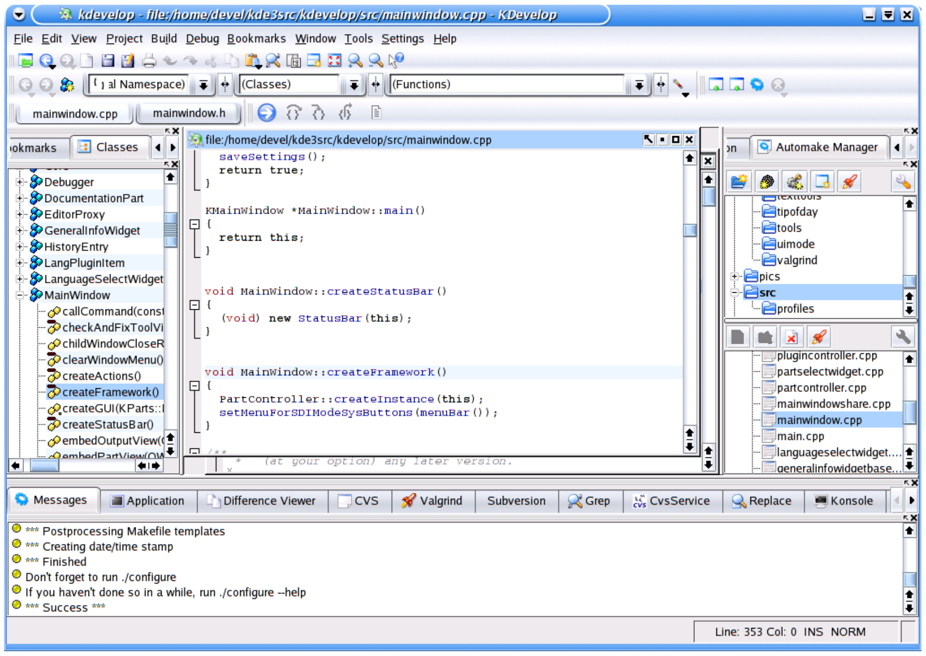
This example screenshot demonstrates one of the main virtues of IDEAl mode. There is a maximum workspace available. Yet any tool view is readily available by clicking on the according tab.

You will most probably need some time to get accustomed to the icons in the tab bar. If you got lost, just position the mouse over a tab and wait a few seconds. A short tool tip description will pop up. In this screenshot the ‘Automake Manager’ tool tip is shown as an example. It describes the lower tab in the right tab bar.

Click here to return to the modes overview.

F.2 Child Frame Windows Mode

Click here to return to the modes overview.



```
  saveSettings();
  return true;
}

KMainWindow *MainWindow::main()
{
  return this;
}


void MainWindow::createStatusBar()
{
  (void) new StatusBar(this);
}


void MainWindow::createFramework()
{
  PartController::createInstance(this);
  setMenuForSDIModeSysButtons(menuBar());
}
```

```
*** Postprocessing Makefile templates
*** Creating date/time stamp
*** Finished
Don't forget to run ./configure
If you haven't done so in a while, run ./configure --help
*** Success ***
```

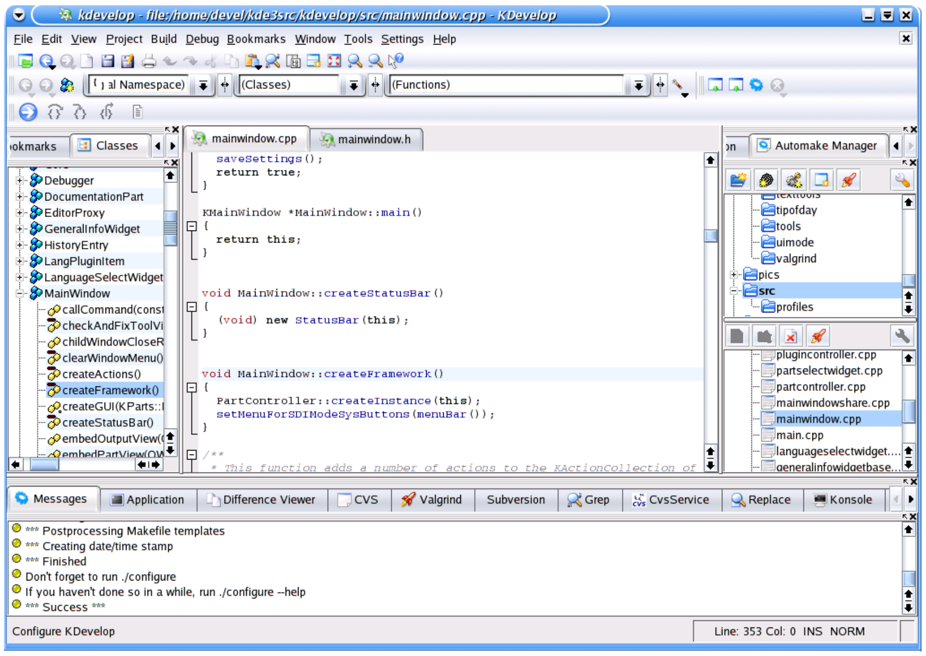
Line: 353 Col: 0 INS NORM

KDevelop child frame windows mode

Click here to return to the modes overview.

F.3 Tabbed Pages Mode

Click here to return to the modes overview.



```
  saveSettings();
  return true;
}

KMainWindow *MainWindow::main()
{
  return this;
}


void MainWindow::createStatusBar()
{
  (void) new StatusBar(this);
}


void MainWindow::createFramework()
{
  PartController::createInstance(this);
  setMenuForSDIModeSysButtons(menuBar());
}

/**
 * This function adds a number of actions to the KActionCollection of
```

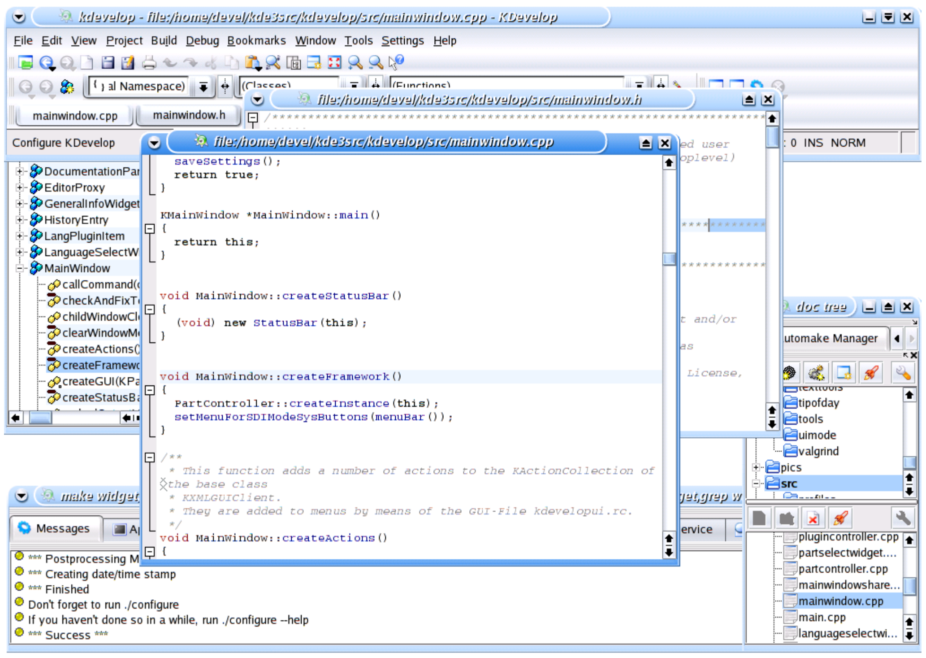
```
*** Postprocessing Makefile templates
*** Creating date/time stamp
*** Finished
Don't forget to run ./configure
If you haven't done so in a while, run ./configure --help
*** Success ***
```

KDevelop tabbed pages mode

Click here to return to the modes overview.

F.4 Toplevel Windows Mode

Click here to return to the modes overview.


kdevelop - file:/home/devel/kde3src/kdevelop/src/mainwindow.cpp - KDevelop
File Edit View Project Build Debug Bookmarks Window Tools Settings Help
mainwindow.cpp
mainwindow.h
Configure KDevelop
file:/home/devel/kde3src/kdevelop/src/mainwindow.h
file:/home/devel/kde3src/kdevelop/src/mainwindow.cpp
doc tree
make widget
Messages

```
  saveSettings();
  return true;
}

KMainWindow *MainWindow::main()
{
  return this;
}


void MainWindow::createStatusBar()
{
  (void) new StatusBar(this);
}


void MainWindow::createFramework()
{
  PartController::createInstance(this);
  setMenuForSDIModeSysButtons(menuBar());
}

/**
 * This function adds a number of actions to the KActionCollection of
the base class
 * KXMLGUIClient.
 * They are added to menus by means of the GUI-File kdevelopui.rc.
 */
void MainWindow::createActions()
{
```

```
*** Postprocessing M
*** Creating date/time stamp
*** Finished
Don't forget to run ./configure
If you haven't done so in a while, run ./configure --help
*** Success ***
```

KDevelop toplevel windows mode

Click here to return to the modes overview.

Appendix G

Command Reference

Volker Paul 2005-04-03

NOTE
The shortcut key combinations shown in this chapter are the default ones. They can be changed.

G.1 The Menubar

Note that some menu entries only appear when they are applicable. Especially, some entries are linked to plugin functionality which is only available when the plugin is enabled.

G.1.1 The File Menu

File → New (Ctrl+N) Create a new file. The user is prompted to select the directory (default: the current project's source directory) and enter a file name. The file type can be selected from a list. Also, the user can choose whether the file is to be added to the project. Then the Automake Manager asks which target to add the new file to.

File → Open (Ctrl+O) Open an existing file in a simple dialog box.

File → Open Recent (Ctrl+O) Displays a submenu showing the files recently opened. Selecting one of these will make KDevelop open that file.

File → Quick Open (Alt+Ctrl+O) Presents a list of files in the current project's source directory. The user can select from this list or type a filename. That file is then opened.

File → Save (Ctrl+S) Saves the current file.

File → Save As... (Ctrl+S) Uses the Save As... dialog box to let you save a copy under a new name.

File → Save All Saves all open files.

File → Reload (F5) Reloads current file to show changes made by different programs. (Note that such changes are normally detected automatically and the user is prompted whether the file is to be reloaded.) .

File → Revert all Reverts all changes in opened files. Prompts to save changes so the reversion can be canceled for each modified file.

File → Print... (Ctrl+P) Print.

File → Export Export

File → Close (Ctrl+F4) Closes current file.

File → Close All Closes all open files.

File → Close All Others Closes all files except the current one. Very useful if you opened a lot of files and you want to concentrate on the current one. Without this, you would have to close them all and re-open the current one.
Note there is a similar command in the Window menu.

File → Quit (Ctrl+Q) Close KDevelop.

G.1.2 The Edit Menu

Edit → Undo (Ctrl+Z) Undo

Edit → Redo (Ctrl+Shift+Z) Redo

Edit → Cut (Ctrl+X) Cut

Edit → Copy (Ctrl+C) Copy

Edit → Paste (Ctrl+V) Paste

Edit → Select All (Ctrl+A) Select All

Edit → Deselect (Ctrl+Shift+A) Deselect

Edit → Block Selection Mode (Ctrl+Shift+B) Block Selection Mode

Edit → Overwrite Mode (Insert) Overwrite Mode

Edit → Find (Ctrl+F) Find

Edit → Find Next (F3) Find Next

Edit → Find Previous (Shift+F3) Find Previous

Edit → Replace (Ctrl+R) Replace

Edit → **Go to Line (Ctrl+G)** Go to Line

Edit → **Find in Files (Alt+Ctrl+F)** Find in Files

Edit → **Find-Select-Replace (Shift+R)** Find-Select-Replace

Edit → **Reformat Source** Reformat Source

Edit → **Expand Text (Ctrl+J)** Expand Text

Edit → **Expand Abbreviation (Ctrl+L)** Expand Abbreviation

Edit → **Complete Text (Ctrl+Space)** Complete Text

Edit → **Make Member (F2)** Make Member

G.1.3 The View Menu

View → **Back** Back

View → **Forward** Forward

View → **Switch to... (Ctrl+/)** Switch to...

View → **Raise Editor (Alt+C)** Raise Editor

View → **Next Error (F4)** Next Error

View → **Previous Error (Shift+F4)** Previous Error

View → **Full Screen Mode (Shift+F)** Full Screen Mode

View → **Switch Header/Implementation (Ctrl+F12)** Switch Header/Implementation

View → **Tool Views** Tool Views

View → **Tool Docks** Tool Docks

View → **Switch to Command Line (F7)** Switch to Command Line

View → **Schema** Schema

View → **Dynamic Word Wrap (F10)** Dynamic Word Wrap

View → **Dynamic Word Wrap Indicators** Dynamic Word Wrap Indicators

View → **Show/Hide Static Word Wrap Marker** Show/Hide Static Word Wrap Marker

View → **Show/Hide Icon Border (F6)** Show/Hide Icon Border

View → **Show/Hide Line Numbers (F11)** Show/Hide Line Numbers

View → **Show/Hide Scrollbar Marks** Show/Hide Scrollbar Marks

View → **Show/Hide Folding Marks (F9)** Show/Hide Folding Marks

View → **Code Folding** Code Folding

View → **Set Encoding** Set Encoding

G.1.4 The Project Menu

Project → **New Project...** New Project...

Project → **Open Project...** Open Project...

Project → **Open Recent Project** Open Recent Project

Project → **Active Language** Active Language

Project → **Import Existing Project...** Import Existing Project...

Project → **New Class...** New Class...

Project → **Class Inheritance Diagram** Class Inheritance Diagram

Project → **Add Translation...** Add Translation...

Project → **Build Configuration** Build Configuration

Project → **Distribution & Publishing** Distribution & Publishing

Project → **Project Options...** Project Options...

Project → **Close Project** Close Project

G.1.5 The Project Menu

Build → **Build Project (F8)** Build Project

Build → **Build Active Target (F7)** Build Active Target

Build → **Compile File** Compile File

Build → **Run Configure** Run Configure

Build → **Run automake & friends** Run automake & friends

Build → **Install** Install

Build → **Install (as root user)** Install (as root user)

Build → **Clean project** Clean project

Build → **Distclean** Distclean

Build → **Make Messages & Merge (Shift+F9)** Make Messages & Merge

Build → **Execute Program** Execute Program

Build → **Build API Documentation** Build API Documentation

Build → **Clean API Documentation** Clean API Documentation

Build → **Stop (Escape)** Stop

G.1.6 The Project Menu

Debug → Start Start

Debug → Stop Stop

Debug → Interrupt Interrupt

Debug → Run to Cursor Run to Cursor

Debug → Step Over Step Over

Debug → Step over Instruction Step over Instruction

Debug → Step Into Step Into

Debug → Step into Instruction Step into Instruction

Debug → Step Out Step Out

Debug → Toggle Breakpoint Toggle Breakpoint

Debug → Viewers Viewers

Debug → Examine Core File... Examine Core File...

Debug → Attach to Process Attach to Process

Debug → Valgrind Memory Leak Check Valgrind Memory Leak Check

Debug → Profile with KCachegrind Profile with KCachegrind

G.1.7 The Bookmarks Menu

Bookmarks → Set Bookmark (Ctrl+B) Add current selection to your bookmarks.

Bookmarks → Clear All Bookmarks Clear All Bookmarks.

G.1.8 The Window Menu

Window → Close Selected Windows... (Alt+W) Close Selected Windows...

Window → Close (Ctrl+F4) Close

Window → Close All Close All

Window → Close All Others Close All Others

G.1.9 The Tools Menu

Tools → **Read Only Mode** Read Only Mode

Tools → **Filetype Mode** Filetype Mode

Tools → **Highlight Mode** Highlight Mode

Tools → **End of Line** End of Line

Tools → **Spelling** Spelling

Tools → **Indent (Ctrl+I)** Indent

Tools → **unindent (Ctrl+Shift+I)** unindent

Tools → **Clean Indentation** Clean Indentation

Tools → **Align (Ctrl+Tab)** Align

Tools → **Comment (Ctrl+D)** Comment

Tools → **Uncomment (Ctrl+Shift+D)** Uncomment

Tools → **Uppercase (Ctrl+U)** Uppercase

Tools → **Lowercase (Ctrl+Shift+U)** Lowercase

Tools → **Capitalize (Alt+Ctrl+U)** Capitalize

Tools → **Join Lines (Ctrl+J)** Join Lines

Tools → **Word Wrap Document** Word Wrap Document

Tools → **Difference Viewer...** Difference Viewer...

Tools → **Execute Command...** Execute Command...

Tools → **Filter Selection Through Command...** Filters selection through external command using the Filter plugin.

Tools → **Debug Regular Expression...** Debug Regular Expression...

Tools → **Part Explorer** Part Explorer

Tools → **Quick Open Class... (Alt+Ctrl+C)** Quick Open Class...

Tools → **Quick Open Method... (Alt+Ctrl+M)** Quick Open Method...

Tools → **Preview Doxygen Output (Alt+Ctrl+P)** Preview Doxygen Output

Tools → **Document Current Function (Ctrl+Shift+S)** Document Current Function

G.1.10 The Settings Menu

Settings → Show/Hide Menubar (Ctrl+M) Show/Hide the menubar.

Settings → Toolbars Opens a sub menu where you can choose to show or hide the various Toolbars.

Settings → Show Statusbar Show the Statusbar.

Settings → Configure Shortcuts... Configure Shortcuts...

Settings → Configure Toolbar... Configure Toolbar...

Settings → Configure Notifications... Configure Notifications...

Settings → Configure Editor... Configure Editor...

Settings → Configure KDevelop... Configure KDevelop...

G.1.11 The Help Menu

Help → KDevelop Handbook View this document.

Help → What's This? (Shift+F1) Draws a question mark (?) beside the mouse pointer, clicking on a window item such as the Stop button will then display a brief explanation.

Help → Tip of the Day Tip of the Day

Help → Look in Documentation Index... (Alt+Ctrl+I) Look in Documentation Index...

Help → Search in Documentation... (Alt+Ctrl+S) Search in Documentation...

Help → Man Page... Man Page...

Help → Info Page... Info Page...

Help → Report Bug... Report bug.

Help → About KDevelop... Display some brief information about KDevelop's version number, authors and license agreement.

Help → About KDE... Show some information about the version of KDE that you are running.

Appendix H

Further Information

H.1 Getting Information

(... to be written ...)

H.2 Reporting Bugs

(... to be written ...)

H.3 Licensing

Appendix I

Changes

I.1 Changes to This Document

- 2003-01-03 Bernd Gehrmann, Caleb Tennis
  - initial manual layout
  - many chapter contents sketched
- 2004-08-01 Bernd Pol, Ian Wadham
  - manual slightly reorganized
  - some missing chapters written
- 2005-05-02 Volker Paul — Many changes, including:
  - split into one file per chapter/appendix
  - added command reference sorted by menu (descriptions not yet complete)
  - AppWizard tutorial in getting-started.docbook
  - reorganized chapters, guided by Konqueror manual
  - moved installation, Unix development, 'In a Nutshell' to the appendix
  - rewrote plugin appendix, incl. plugin list generator listplugins.sh

  Still far from complete, but a small step forward.
- 2006-05-20 Bernd Pol — Filling in some more 'to be written' holes:

Appendix J

Bibliography

(... to be written ...)

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Appendix K

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