Computer-Based Project on VLSI Design   Co 3/7

Laboratory Guide 1 - a brief introduction to the Falcon Framework

This laboratory guide provides an introduction to the features of the Mentor Graphics Falcon Framework, *Design Manager* and the *Adobe Acrobat-based* On-Line Documentation Browser.

1. Login as instructed using the login assigned to you and your partner. Use the information in the *Getting Started* pamphlet to start up *Design Manager*. You should see a Tools window and a Navigator window. Identify the **framework** icon in the Navigator window, and double-click with the left mouse button. Observe the **readme** file in the Navigator window.

2. Left-click on the **readme** file. It should appear selected (in reverse video).
Now click on the selected **readme** file with the rightmost mouse button (**Menu**). A menu appears. Move the cursor down the list until it is on **Edit**, then move it to the right onto the arrow symbol; a sub-menu will appear. Move the cursor so as to highlight the command: **Copy**, and right-click again.
A prompt bar appears in the lower left of the screen. Enter the name of the new file to be created, which will be a copy of **readme**, e.g. **my_copy**.
Now left-click the **OK** button on the prompt bar. The Navigator window will be updated to show a copy of the file with the name you gave it.

3. Start up the System Default Editor on this file, by doing the following:
Select the copied file by left-clicking on it.
Right-click the selected file and move the cursor down to the arrow on the right of **Open**, and a sub-menu will appear listing all the Mentor tools that are capable of starting up with the selected design object.
Select **Default Editor** and left-click it. This starts up the Mentor *Notepad* editor. You will make use of this utility in later sessions to prepare scripts and other documents.
Observe that the *Design Manager* menu bar changes; the commands available are now those for the *Notepad* utility. Verify that you can edit the text that you now see; when ready, close the *Notepad* editor by double-clicking on the system icon in the upper left corner of the window. Save the changes if you wish.
Note the availability also of a **Read Only Editor**, provided for viewing files without changing them in any way.

4. Examine the *references* of a design object.
Select **cell_X**. Display its external references (i.e. the other design files or resources upon which it depends) by using the **(menu bar) > Report > Show References** pulldown menu item.
Examine the test window that appears. You should see that **cell_X** refers to a *Process* (denoted by MIETEC_CMOS24_IC_PROC), a set of *Rules* (denoted by MIETEC_CMOS24_IC_RUL), and a second cell, **cell_Y**.
When ready, close the References window by double-clicking on its system icon.

5. Copy design objects **cell_X** and **cell_Y** to another directory.
    Open a further Navigator window by clicking the **Navigate** icon in the palette; switch this new Navigator window to the **framework** directory by double-clicking its icon. Identify the **sub_dir** directory icon, and enter the directory in a similar way.
    Back in the original Navigator window, select the object **cell_X** by clicking on it. Then select the object **cell_Y** as well, by depressing the **Ctrl** key while clicking on it. Both cells should now be selected.
    Copy these two cells to the directory **sub_dir** by holding down the **Shift** key and dragging the two icons into the new Navigator window.
    Activate the new Navigator window by clicking in it. Then give the command: **(menu bar) Report > Show References**. Two reference windows should now appear.
    The reference window for **cell_X** will show that the copied version references not the *original* **cell_Y**, but the *new* **cell_Y** in the directory **sub_dir**. The *Mentor* copy operation has actually changed the references; it is evidently a much more powerful operation than the Unix **cp** command.
    Close both Reference windows.
    Close the **sub_dir** Navigator window.

6. Examine a design cell containing a faulty reference.
    In the original Navigator window, select the object **bad_object**, then give the command: **(menu bar) Edit > Check Refs**.
    OK the prompt bar.
    You will see in a dialogue box that one reference is broken. Cancel the dialogue box when ready.

7. Use *Acrobat* to read about broken references.
    Select the item: (**menu bar) Help > Open Bookcase** to start up **Adobe Acrobat**. Note that the *Acrobat* utility is accessible by means of the **(menu bar) Help** menu from any of the Mentor applications.
    You may wish to drag the *Acrobat* window to a different *fvwm* virtual screen. The resultant window, should contain a menu of Mentor Bookcases (Manual Collections) from which you can select. If necessary, give the following command in the Acrobat window: **(menu bar) MGC** > **View Installed Bookcases**.

    Click once on **Falcon Framework**.
    Note the comprehensive list of documents - this is but a small fraction of the material that is available. Scroll down to find the **Design Manager User's Manual** and click it once.
    The manual will open up, typically in a much larger window. Expand the *Acrobat* window to fill as much as possible of the screen by dragging out the lower right hand corner. You may need to move the window to a different virtual screen (grab the left or the right margin with the pointer) in order to access its menu bar. Once you have done this, you can use the **Maximise** button (double-click at rightmost end of title bar) to maximise the window's size.

8. In the **Design Manager User's Manual** child window, give the command: **(menu bar) > View > Single Page**.   Depending on the screen resolution available and your own preference, you may wish to view two pages side by side: if so, try the

command **(menu bar) View > Continuous – Facing**, and, if wished: **(menu bar) > Window > Hide Bookmarks** to suppress the bookmarks and dedicate the whole window to text. Note that icons are provided in the toolbar to help you make these adjustments more quickly. Experiment with them if you wish.

9. If the bookmarks were suppressed in (8) above, reinstate them temporarily. Click on the **INDEX** bookmark, visible in the left pane of the *Acrobat* display, headed: 📑 **Bookcase.**   *Acrobat* will now display the index section of the document.

Now find the entry for "References, fixing" (3-85), by turning the pages (click on the **Page turn** icons, ▶ and ◀, in the toolbar, or use keyboard shortcuts **Control+2** and **Control+3** to move backwards and forwards through the index section.
Place the cursor on "3-85" and click.
Read the section on fixing broken references, especially page 3-86 to 3-87. Note: you can safely ignore references to **V7.x** data, which correspond to earlier versions of *Mentor*.
If time permits, explore the other bookcases and documents, by reverting to the small *Acrobat* bookcase window – click on the 📑 **Bookcase** in the bookmark panel.

10. Now, back in *Design Manager*, ensure the Navigator window is active, and re-select **bad_object**.
Give the command: **(menu bar) Edit > Check Refs**. With the help given by *Bold Browser* you should be able to fix the broken reference.
Hint: the reference should actually be to cell_X.
Now re-check the references. A message: "**No broken references were found**" should appear in the message area at the foot of the *Design Manager* window.

This concludes our preliminary investigation of *Design Manager*. If you plan to continue with the next Lab Guide which explores *Design Architect*, leave *Design Manager* running. If you propose to log out, first close down the *Acrobat* browser and any other tools that remain open; finally; close *Design Manager* and log out.