GWM Test Generator User Manual

SEDS Decision Support laboratory

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SOFTWARE ENGINEERING
DECISION SUPPORT
LABORATORY

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Chapter 1 Installation on Windows

1.1 Requirements

The GWM Support Tool requires Python3.4 or above and PyQt5.

This user manual only provides details for Windows operating systems, but the GWM Support Tool can also run on Linux and Mac operating systems if Python and PyQt5 are installed correctly.

- Python 3.4 or higher installed in the Path
- PyQt5 python module

1.2 Installing and Running the GWM Test Generator

1. Get the zip file for the GWM Support Tool from a SEDS lab member.
2. Extract the zip file to any desired location.
3. Navigate to the extracted folder in the command line and run the command python GWM_Test_Generator.py

1.3 Installing Python

The most recent binary installer for Python can be found at python.org/downloads/, select a version higher than 3.4 and download the correct installer for your machine bit size. Double click the installer and follow the steps, include Python in the path when the option is given.

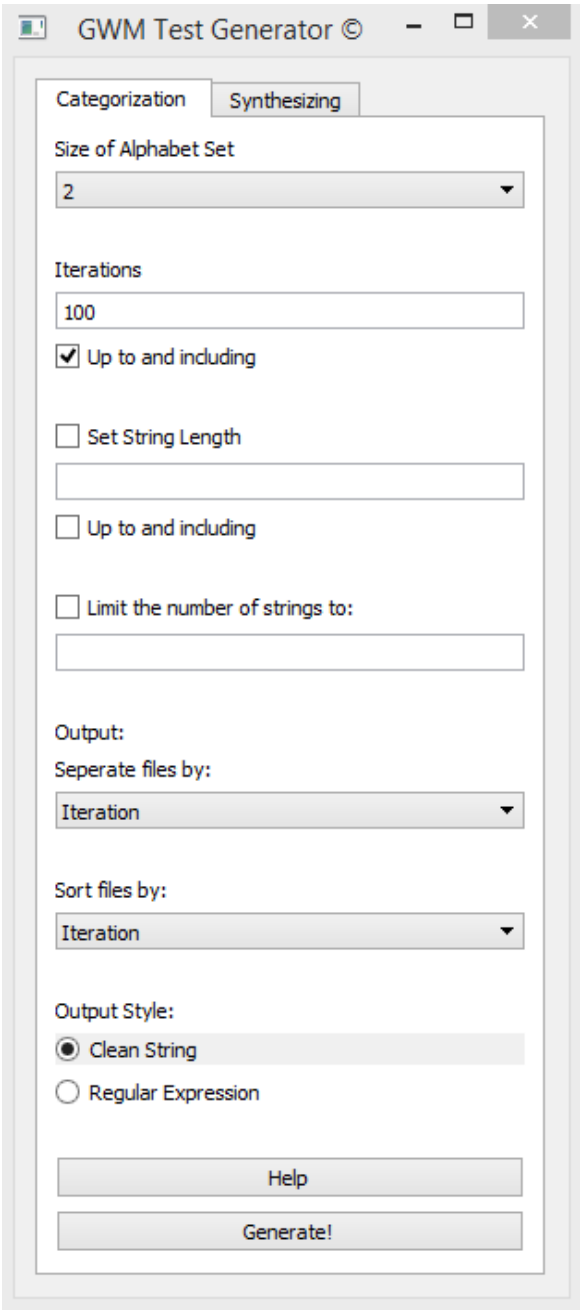
1.4 Installing PyQt5

The binary installer can be found at
http://sourceforge.net/projects/pyqt/files/PyQt5/PyQt-5.4.2/.
Double click the installer and follow the steps.

Chapter 2 Categorization

2.1 Using the Categorization Tab

To use the Categorization tab, specify all desired settings and then click generate.



2.1.1 *Size of Alphabet Set*

The “Size of Alphabet Set” option refers to the number of characters that are used to encode the itemset. Selecting '2' would result in the iteration of "A" and "B";

selecting '3' would result in the iteration of "A", "B", and "C", and so on. The default setting is an iteration with '2' characters naming “A” and “B”.

2.1.2 *Iterations*

The iterations option applies particular number of production rules for all the regular expressions. If the option is set at 10, then the 10th iteration step of all the regular expression after applying 10 production rules will be outputted.

2.1.3 *Iterations - Up to and including*

The iterations –“up to and including” option sets how many strings (or more specific regular expressions) are generated from each regular expression. The default setting is up to and including 100 iterations which means that the output result would yield the first 100 strings generated by applying production rules on each regular expression. For example, for Σ = {A,B}, strings would be A, B, AB, BA AAB, ABB, BAA, BBA, … up to the strings having 100 characters,

2.1.4 *String Length*

To generate strings with specific string length the "Set string length" option could be used. This option sets the output string length to the chosen number. The desired string length can be selected, which results in the output strings to all be of the chosen length on the selected set of alphabets. The default setting is to leave the option unselected and the output would include strings with variety of lengths.

2.1.5 *Length – Up to and including*

The "Up to and including" checkbox sets the output to being all the strings up to and including the chosen length. If the option is set to be “Up to and including” 10, then the output strings will range in length from 1 to 10 characters long.

2.1.6 *Results*

The "Limit number of strings to " textbox limits the total number of strings that will be produced by the program. The default setting is to leave "Limit number of results to" unselected.

2.2 Output Files

The output files can be found in the folder Categorization Tests.

2.1.1 *Output File Format*

The output is in the CSV format being suitable for using in GWM tool support© for testing. At each use of this test generator tool, one CSV file is created which is separated into files by iteration, length, or only by using specific regular expression based on your selected options.

- Separating the files by iteration – This choice stores all the strings produced in a given iteration in one file. The default setting is for the files to be separated by iteration.
- Separating the files by length – This choice stores all the strings produced by a given length in one file.
- Separating the files by regular expression – This choice stores all the strings following a given regular expression in one file.

The output files will be stored in a folder called "Categorization Tests".

- If the files are separated by length, then the name of the CSV file would be "Length-"followed by a number which is the length of the strings in the file.
- If the files are separated by iteration step, then the CSV files will be named "Iteration-"followed by a number which is the iteration step of all the strings in the file.
- If the files are separated by the regular expression, then the CSV files will be named "Regular Expression-"followed by a number that is the entry of the particular string in the input file.

2.2.2 *Sorting the Results in Output Files*

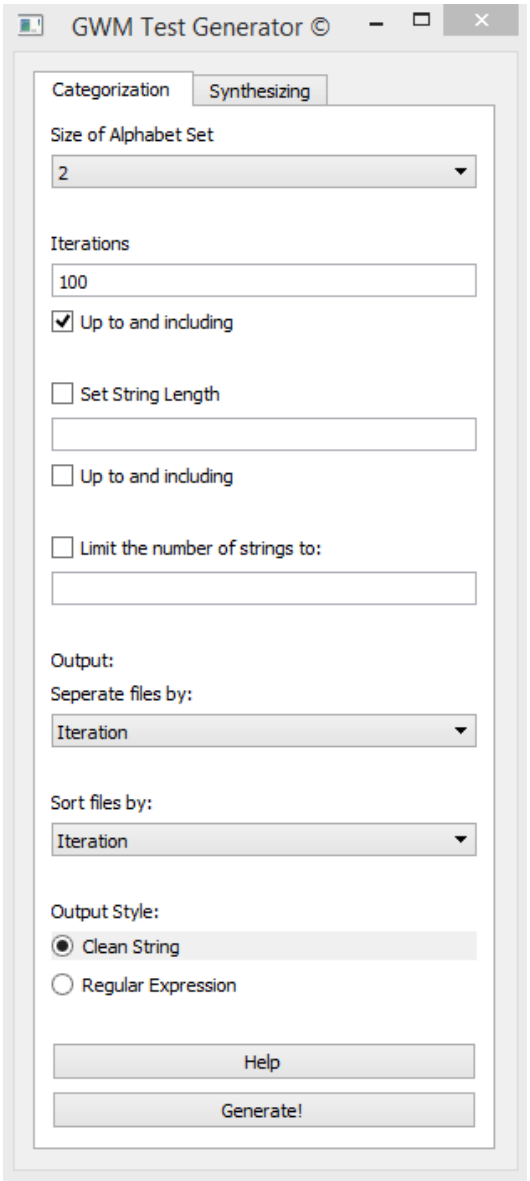
The output files can be sorted by the iteration, the length of the strings, and the specified regular expression.

- Sorting by iteration - results in the output files being sorted by the iteration step in ascending order. Which means that the first iteration step of all the regular expressions will be stored in one file; the second iteration step of all the files will be stored in the second file, and so on. The default setting is for the files to be sorted by iteration.
- Sorting by length - results in the output files being sorted by length, in ascending order.
- Sorting by regular expression - results in the output files being sorted in the same order as they were in the input files

Chapter 3 Synthesizing

3.1 Using the Synthesizing Tab

To use the Categorization tab, specify all desired settings and then click generate.



3.1.1 *Size of Alphabet Set*

The “Size of Alphabet Set” option refers to the number of characters that are used to encode the itemset. Selecting '2' would result in the iteration of "A" and "B"; selecting '3' would result in the iteration of "A", "B", and "C", and so on. The default setting is an iteration with '2' characters naming “A” and “B”.

2.2.1 *Final Number of Patterns*

This setting represents the final number of patterns that should be in place after merging. The maximum number depends on the size of the template of the specified alphabet set. The following is a list of maximum sizes.

- Size 1 – Maximum 2 final patterns
- Size 2 – Maximum 19 final patterns
- Size 3 – Maximum 142 final patterns
- Size 4 – Maximum 1207 final patterns
- Size 5 – Maximum 12356 final patterns

3.3.1 *Datapoints per Node*

This option selects the amount of randomly generated datapoints for each node.

3.2 Output Files

The output files can be found in the folder Synthesizing Tests. They name of the file is dependent on the current date, current time, and specified settings. The output file name format is as follows:

YYYY-MM-DD HH-mm-ss TemplateSize FinalPatterns Datapoints