Supplementary Material

Basics of Xilinx Vivado

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Creating a New Project

To create a new project follow the instructions from this YouTube tutorial:

https://youtu.be/wqm2dgQsj_A

Vivado GUI guide

This section explains the basic of Xilinx Vivado GUI, this section provides only the basic explanation to get you started and is not an exhaustive list of all the feature. Please refer to the Vivado User Guide for more information.

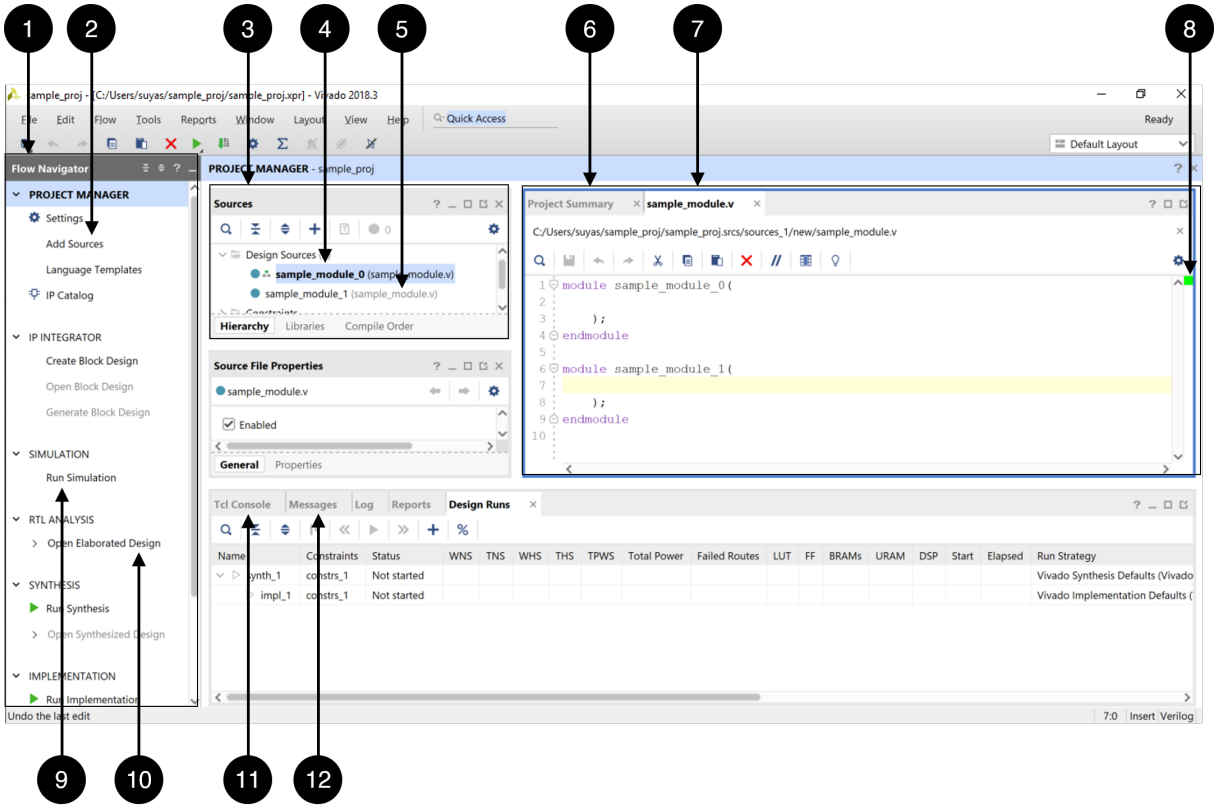

Figure 1: Overview of Xilinx Vivado GUI.

Fig. 1 shows the overview of Xilinx Vivado 2018.3 GUI, the important sections of the GUI are explained below:

1 **Flow Navigator** Pane contains the options for different operations during a common design flow this includes option to include new source files (2), run simulation (9) or to open elaborated design (10).

2 **Add Sources** option allows adding creating new source files/adding existing files to the project.

3 **Sources** pane lists all the modules in the project along with the file they belongs to in a hierarchical fashion.

4 **Current Top Module**'s name is listed in bold face. Both *Design Sources* and *Simulation Sources* have their corresponding top level modules. Top level module in *Simulation Sources* is used for simulation and top level modules from *Design Sources* is used for generating elaborated design.

5 **Other modules** which are not top level module are shown in normal face (unlike 4).

6 **Workspace** in Vivado contains all the schematic, text editors and simulation windows unless undocked.

7 **Text editor** currently selected is highlighted with the file's name in bold face. If the file is unsaved an asterisk(*) will appear next to the name.

8 **Green square** next to the scroll bar indicates that the code is free from common syntax errors. This square turns red if the source code has syntax errors. Please note that this feature is just for indication of possible syntax errors, even though if the square is green your code might be logically incorrect or might be syntactically incorrect.

9 **Run Simulation** allows you to run simulation using the currently selected top level module in simulation sources. A new window is opened in the Workspace (6) to view the waveforms.

10 **Open Elaborated Design** generates the schematic representation of your design.

11 **Tcl Console** contains log of all the errors and warnings generated during past operations (you might have to scroll through several lines before finding the relevant warning/error).

12 Vivado reads the Tcl console output to list common errors and warnings as a user friendly format in **Message** Pane. Please note that you might still have to access the *Tcl Console* pane for finding information on errors.

Adding an Existing Testbench To Your Project

To add an existing testbench to your code follow the instructions from this YouTube tutorial:

https://youtu.be/wqm2dgQsj_A (Using existing testbench with Vivado)

Document History

1. **Mon Feb 4 10:25:06 IST 2019**: First edition