Introduction to the Lab

Softwares to Install

In this lab, you need to require the following softwares:

Vivado Design Suite

Vivado Design Suite is a software developed by Xilinx for the synthesis and implementation of different HDL designs. The Vivado Design suite **web-pack** is available free of charge. Use the 2018.2 or later version.

QuestaSim

The Questa Advanced Simulator is a simulation and debug engine of the Questa Verification Solution, for hardware descriptive languages (like System Verilog and VHDL). The software is available at the following link https://eda.sw.siemens.com/en-US/ic/questa/simulation/advanced-simulator/

Xcelium

Xcelium simulator is available on the computers in the lab.

Visual Studio Code

Visual Studio Code is a free open source code editor.

1. Download VS Code from the following link: https://code.visualstudio.com/Download.
2. Beginners tutorial for VS Code can be found at here and here.
3. Extensions for different languages required can be obtained from Visual Studio Market Place . One for System Verilog is: https://marketplace.visualstudio.com/items?itemName=eirikpre.systemverilog

Circuit Development Platform - Nexys A7

Nexys A7 is ready to use digital circuit development platform that features the Artix-7 field programmable gate array(FPGA). This board includes several peripheral devices like temperature sensor, accelerometer etc. There are two variants of this board which includes A7-50T and A7-100T. In this lab, we will be using A7-100T which has greater field array as compared to A7-50T.The important components of the FPGA are shown in Fig. 1. And the components highlighted in Fig. 1 include:

1. Xilinx Artix-7 FPGA.
2. Power Jack used for providing power to the board.
3. JTAG port for transferring the bit-stream file from the computer to the FPGA.
4. Shared UART/JTAG USB port(which will be used in the lab for programming the FPGA and providing power to it.)

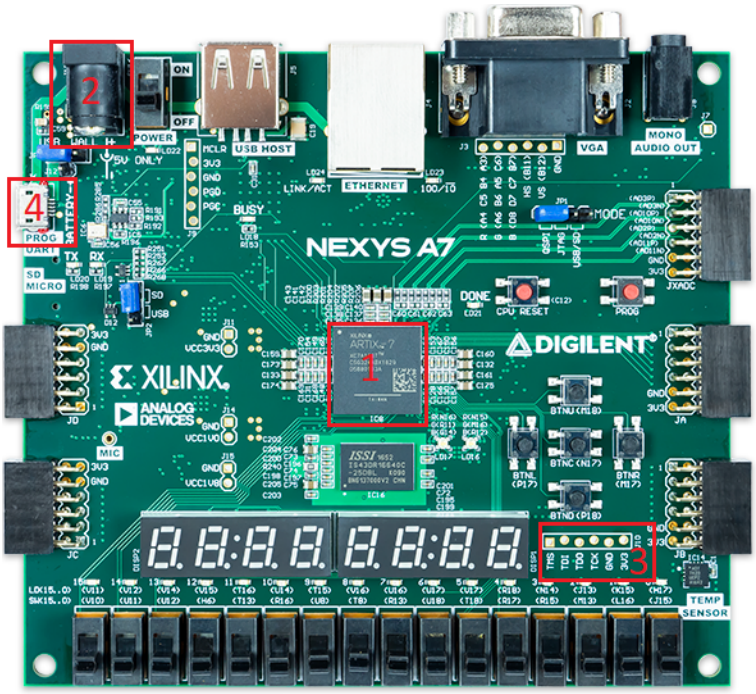

Fig. 1: Nexys A7 Development board

To learn further about Nexys A7, you can access the reference manual from the following link: https://reference.digilentinc.com/reference/programmable-logic/nexys-a7/reference-manual

To install board support for Nexys A7 board, extract the files available from https://github.com/Digilent/vivado-boards/archive/master.zip. Open the folder extracted from the archive and navigate to its *new/board_files* folder. Copy all of its sub-folders. In Vivado installation directory, navigate to *data/boards/board_files*. If this folder doesn't exist, create it and then paste the files in this folder.

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