CSEE W4823 ADVANCED LOGIC DESIGN

Quartus II Tool Setup

Quartus is a CAD tool produced by Altera for analysis, synthesis and simulation of HDL designs. It enables the developer to model their digital design, perform timing and functional simulations, synthesize the design to measure the design's maximum operational frequency, and implement the design for a target device such as an FPGA. This document presents a brief description of how to obtain and access the software locally or remotely. You can either use machines in the Embedded Systems Lab (locally or remotely), or download software to your laptop.

What policies am I required to observe in using the Embedded Systems Lab (Mudd 1235)?

Important: Be sure to read the "EE Computer Lab Policy" document, which is available on the CSEE4823 class web page.

How to obtain and access Quartus II software?

From Embedded Systems Lab: The QuartusII (v7.2) software is available on machines (micro1.ilab.columbia.edu … micro31.ilab.columbia.edu) at Embedded Systems Lab (Mudd 1235). Do not use later versions, they may not be compatible with the assignments! These machines can be accessed in the following ways.

(i) **Locally -** The students are required to have swipe access in order to enter the lab and an individual account to login to the machine. The professor has already forwarded the student CUID's and UNI's, so all the students in the class shortly should have both swipe access to the room and accounts on the lab machines. For any issues related to swipe access, please contact King-Tung Chan (kc2681@columbia.edu). For all account/disk-quota/machine/software related issues, please contact trouble@ee.columbia.edu or TAs.

To access Quartus locally on any machine in Embedded Systems Lab, first log in using your UNI and password and then follow these commands on terminal:

```
export QUARTUS_ROOTDIR=/tools6/altera/quartus7.2      // To setup path
cd /tools6/altera/quartus7.2/bin
./quartus     // To run the software
```

(ii) **Remotely –** Students can also access the Embedded Systems Lab machines remotely in the following principle ways.

a. Windows – Download and install mobaxterm home edition v9.3 (portable version) from here: http://mobaxterm.mobatek.net/download-home-edition.html. Mobaxterm is similar to terminal in Linux or Mac. Alternatively, Windows users can also install a Linux emulator like cygwin or Linux VMWARE workstation.

b. Linux or Mac: Linux or Mac users need to type the following commands on their terminals in order to access the lab-machines.

Commands to access once mobaxterm/terminal is opened:

If a user with UNI `qy2123` intends to login to `micro20.ilab.columbia.edu`, he or she needs to type following commands in their terminal.

```
ssh -X qy2123@micro20.ilab.columbia.edu // To remotely login to the machine
export QUARTUS_ROOTDIR=/tools6/altera/quartus7.2 // To setup path
cd /tools6/altera/quartus7.2/bin
./quartus  // To run the software
```

Issues in Using Lab Machines

There are 31 computers (micro1.ilab.columbia.edu … micro31.ilab.columbia.edu) in the Embedded System Lab (Mudd 1235). Please note that during the semester, some problems could occur to some of the machines and you cannot use it. If you come across issues about the computers, please contact trouble@ee.columbia.edu or the TAs.

Right now we have checked the status of these machines, remote (Windows/Mac/Linux) accesses work fine with following computers:

1, 2, 3, 4, 6, 7, 9, 10, 13, 16, 17, 19, 21, 23, 25, 26, 28, 30, 31

How to use Quartus II software?

Please follow Quartus tutorial in Appendix B (pp. 833-862) of **Stephen Brown and Zvonko Vranesic, "Fundamentals of Digital Logic with VHDL Design"** (3rd edition) for a basic tool usage.

When you create a new project on the lab machines, be sure to create it under a folder in your home directory, and not in the default directory. (You do not have write permission for the default directory, so if you try to use it, Quartus may hang and need to be killed from the terminal.).

For personal laptops:

(i) Windows:
https://www.altera.com/downloads/software/quartus-ii-we/dnl-quartus_we-v72.tablet.html

(ii) Linux:
https://www.altera.com/downloads/software/quartus-ii-se/dnl-quartus_sub-v72.tablet.html

(iii) Mac:
Run a virtual machine, and do exactly the same as with Windows, above. A virtual machine (VM) is an emulation of a particular computer system. One of the most popular virtual machines is vmware, use the following link to download: http://www.vmware.com/

Note: To download, you will have to create an account on Altera's website. Quartus II v7.2 can be used without a license file for 30 days. To get a free renewable 150-day license file, you can go to the following link:

https://www.altera.com/mal-all/mal-signin.tablet.html?resource=%2Fcontent%2Faltera-www%2Fglobal%2Fen_us%2Findex%2Ff%2Fdownload%2Flicensing%2Flic-q2web.html&$$login$$=%24%24login%24%24

Some Notes on Machine Usage in Mudd 1235

- Please DON'T shut down or restart a machine after you finish using it and DON'T restart a machine if it is locked by someone else. Such behavior may cause loss of work for other users or remote users. You should just log out after using the machines.
- A machine could turn out to be slow if it is used by multiple users at the same time (remotely or locally). So if you met with such situations, please switch to use another machine. This will make more users comfortable.

For any issues on Quartus installation, VHDL usage or remote connection, please contact Yichun Deng (yd2348@columbia.edu) or Song Wang (sw2996@columbia.edu).