Assignment description, project 1

Objective

The purpose of this assignment is to get acquainted with the hardware description language and the hardware simulator and to design all the logic gates and combinational chips that are needed for the Hack computer architecture.

All projects should be done individually.

Contract

Implement the following chips starting from the chip NAND and the defined input *false* as given. Verify your implementations by the HDL hardware tool.

1. Not, And, Or, Mux, Dmux
2. And16, Or8Way, Mux16, Mux4Way16, DMux4Way
3. HalfAdder, FullAdder, Add16, Inc16
4. ALU

Resources

You will need the HardwareSimulator tool of the software package that you must download from nand2tetris.org to your computer. It also contains all project folders; you find templates and test script for all chips in the folder projects/01 and projects/02.

Delete the templates for the chips that are *not* part of the project (otherwise the simulator will use them and it will cause errors).

For the project, read the *Hardware Survival Guide* (link from course web) and go through the hardware simulator tutorial. There are links under *Resources* on the course web.

Hints
- The input pins on a part are always on the left of an equal sign (=); the signal connected to the pin is always on the right.
- To assign a value *true* or *false* to a pin of a bus, use *b[i]=false* or *b[i]=true*.
- For fan out, use "*out=a, out=b*" which means that pin *out* on the chip gives two signals, *a* and *b*.

Submission
- Your project must be mailed to *your group leader* no later than 08.00 on March 24, 2017.
- Subject field should be *EP1200-seminar1-GroupN-Firstname-Familyname*, if you are in group *N*.

One submission per student, in a zipped file named *EP1200-projectM-GroupN-firstname-familyname.zip* including:
- The solutions (typically code).
- The list of the sub-projects you solved successfully and are able to present. Use the provided form. Do not forget to write your name on it!

Copying and other forms of plagiarism and cheating will be reported for disciplinary action!