


**Modelsim (PE Student Edition) Installation Guide**  
**ECE 2500: Computer Organization and Architecture**  
**Virginia Tech**  
**March 12, 2014 (Revised: November 20, 2016)**

**INSTALLATION OF MODELSIM:**

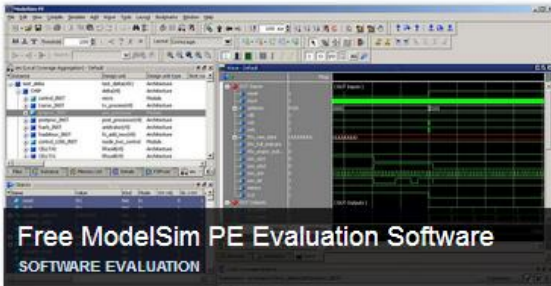
1. Go to <http://model.com> and click on the *ModelSim Student Edition* link.

## ModelSim - Leading Simulation and Debugging

To maximize your online experience and provide you a robust resources library for our verification products, we have redirected [model.com](http://model.com) to a new **FPGA Verification** area on [mentor.com](http://mentor.com).




### ModelSim in Action



**Free ModelSim PE Evaluation Software**  
SOFTWARE EVALUATION

### Improve By Measuring Verification



**ModelSim Essentials**  
ON-DEMAND WEB SEMINAR

- Code Coverage is native
  - Easy to use – **Just turn it on**
  - Quickly find untested portions of your design
    - Eliminate time chasing bugs
  - Efficient database and reporting flows
- Measure and improve verification
  - Merge all coverage databases
  - Rank tests

Tutorial: Chapter 10: Simulation

### Looking for the ModelSim Student Edition?

If you are looking for the ModelSim Student edition, please visit our Higher Education Program.

2. Click on the *Download Student Edition* link.

ModelSim PE Student Edition

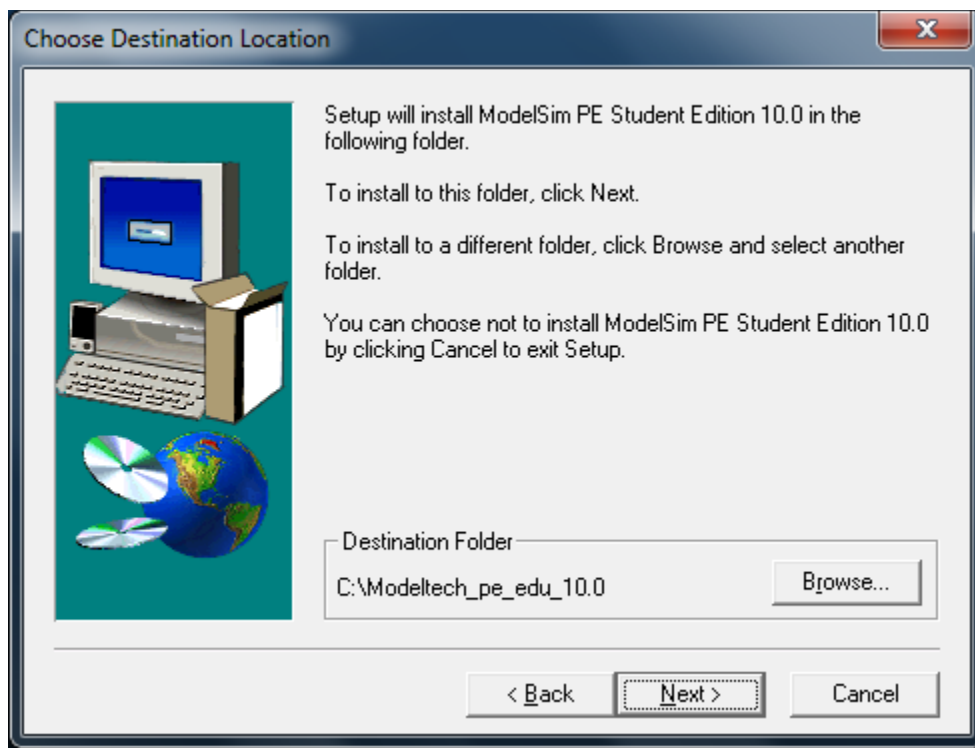
Free download of industry leading ModelSim® HDL simulator for use by students in their academic coursework.

[Download Student Edition ModelSim PE](#)

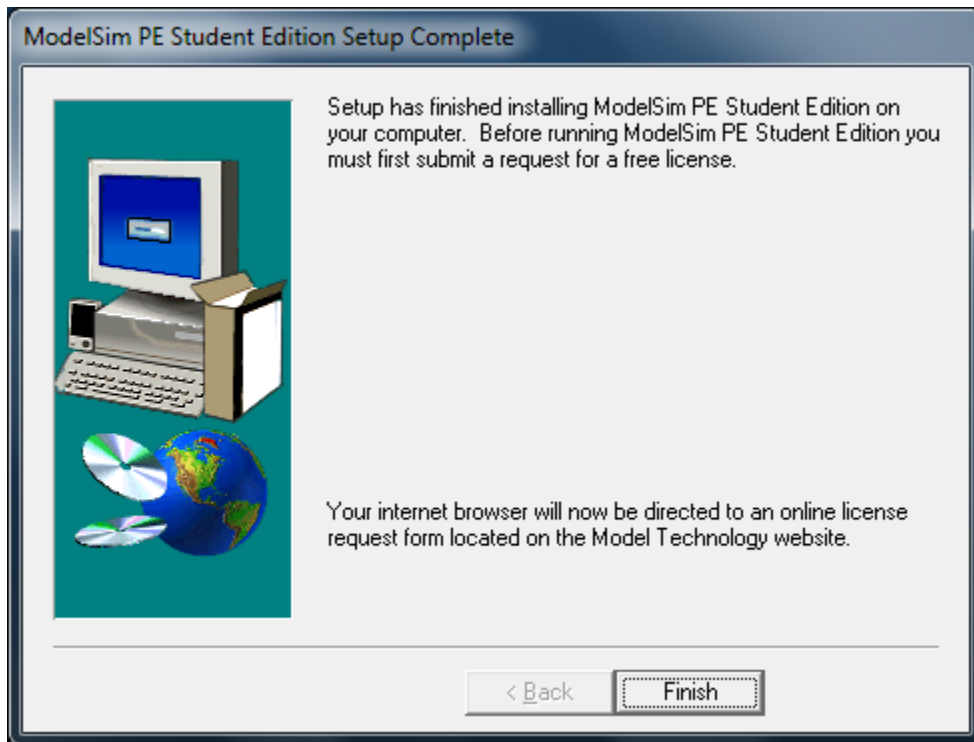
**About ModelSim PE Student Edition**

Highlights	Target Use and Upgrades	Performance
<ul style="list-style-type: none"><li>• Support for both VHDL and Verilog designs (non-mixed).</li><li>• Intelligent, easy-to-use graphical user interface with TCL interface.</li><li>• Project manager and source code templates and wizards.</li></ul>	<ul style="list-style-type: none"><li>• ModelSim PE Student Edition is intended for use by students in pursuit of their academic coursework and basic educational projects.</li><li>• For more complex projects, universities and colleges have access to ModelSim and Questa, through the Higher Education Program.</li></ul>	<ul style="list-style-type: none"><li>• Capacity: 10,000 lines of executable code</li><li>• Performance (up to capacity): 30% of PE</li><li>• Performance (exceeding capacity): 1% of PE (i.e., 100 times slower than PE).</li></ul>

3. Run the downloaded *modelsim-pe\_student\_edition* executable (231 MBytes). Click *Next*. Agree to the license conditions, and to the default destination folder.



4. Click *Next*. Installation will begin. Click on *Yes* for popup questions. Click on *Finish*.

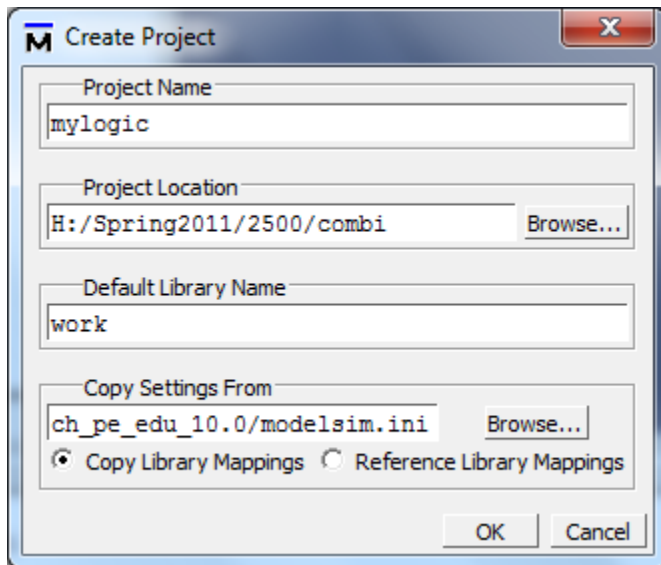


5. A browser window will appear for you to obtain a license. Provide the requested information (again) and click on *Request License*. The ModelSim license cannot be transferred to other machines since the license request includes your hard disk serial number.
6. In less than an hour a *student\_license.dat* file should be e-mailed to you from info@model.com. The e-mail includes instructions for installing the license. After completing that step, you are ready to run test example.

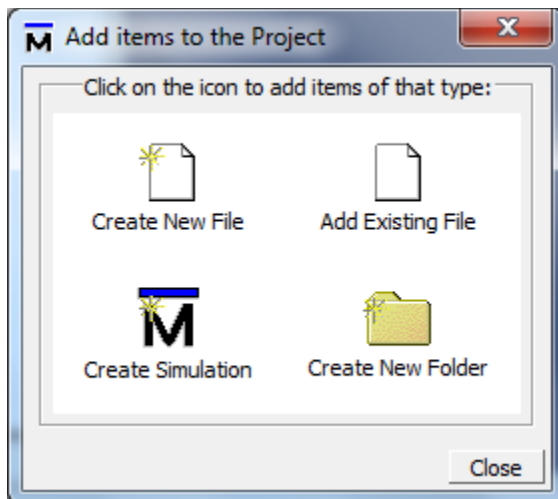
## **RUN TEST EXAMPLE**

1. Download *mylogic.v* and *tb\_mylogic.v* from canvas. Take a look at these (ASCII) files. The former describes our first example from the lectures, a 3-gate combinational circuit. The second file is a "test bench" that controls the circuit's inputs. By following these instructions, you will see how ModelSim can be used to exercise a simple combinational circuit.
2. Run ModelSim. On my Win7 machine, I do this by selecting *Start → All Programs → ModelSim PE Student Edition 10.0 → ModelSim*.
3. Dismiss the Jumpstart popup, and select *File → New → Project*. A *Create Project* window will appear. Type the name of the project (here it is *mylogic*). Click *Browse* near

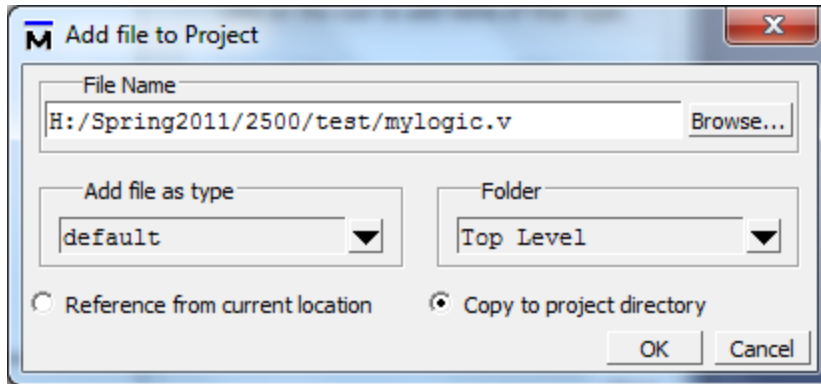
*Project Location* and specify an appropriate project directory. A possibility would be *<user-directory>/2500/combi*, as shown in the next figure.



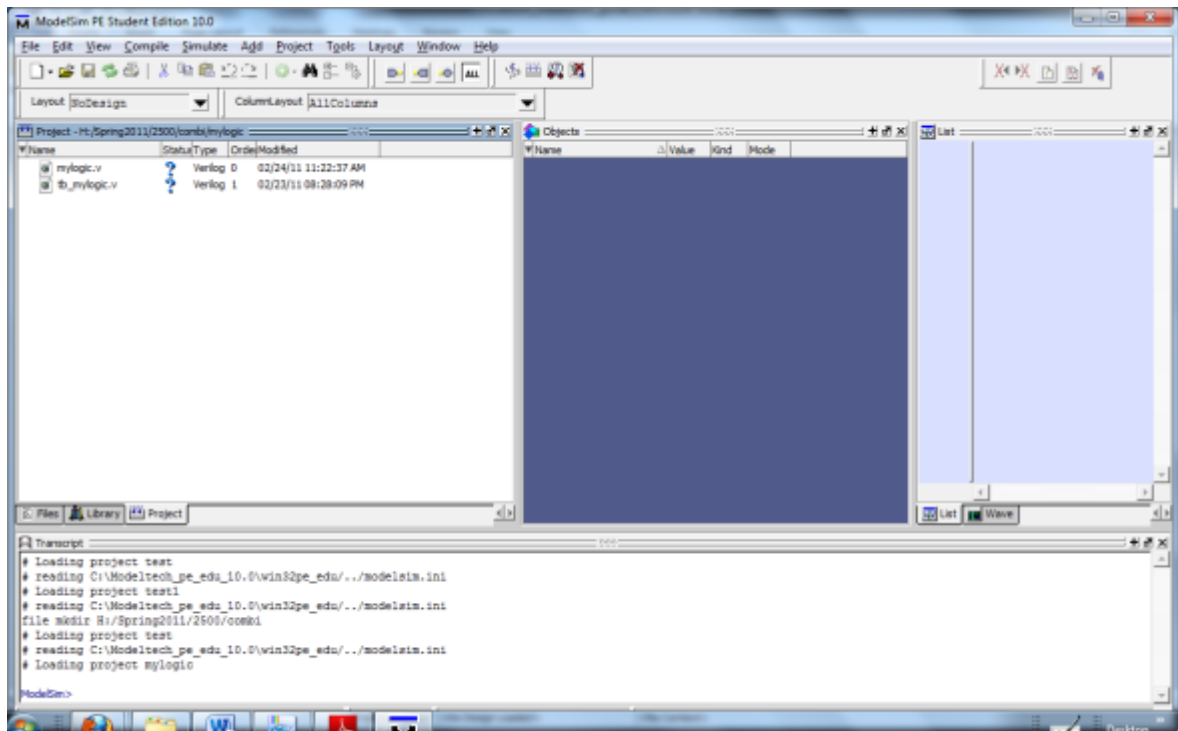
4. A new window will appear. Click on *Add existing files*.



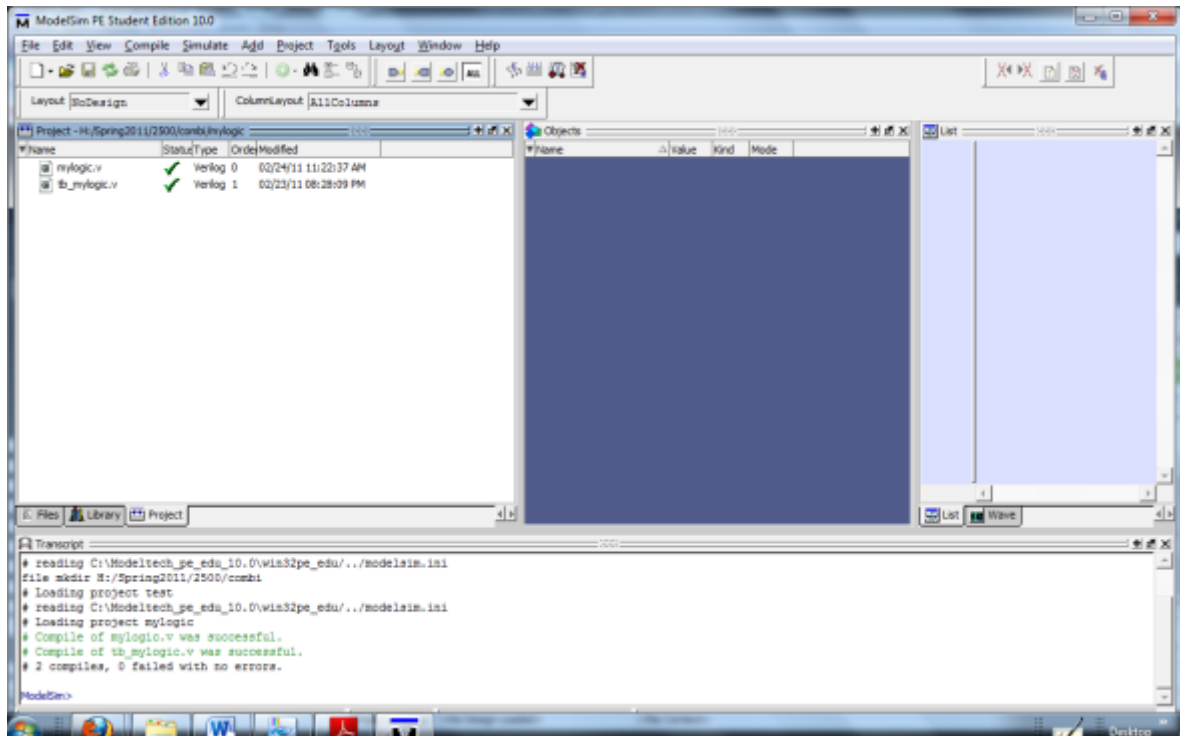
5. Separately for both downloaded files, browse and select *mylogic.v* and *tb\_mylogic.v*. Click on *Copy to project directory* and *OK*.



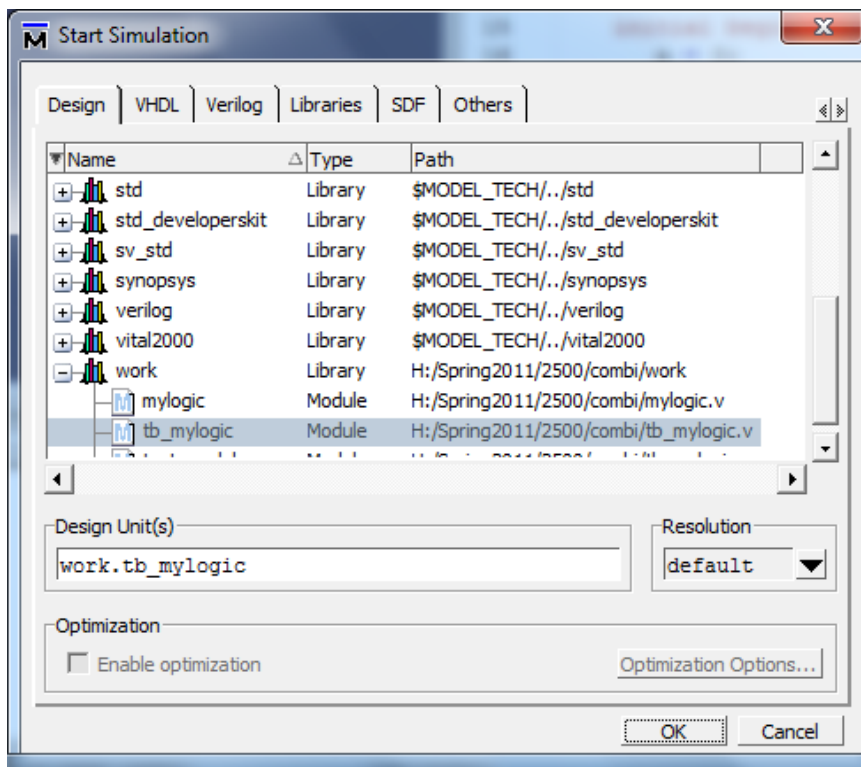
6. Select *Close*. The ModelSim window will look something like the following. Possibly your window will not show contain so many subwindows, but you should be able to see the file names *mylogic.v* and *tb\_mylogic.v*.



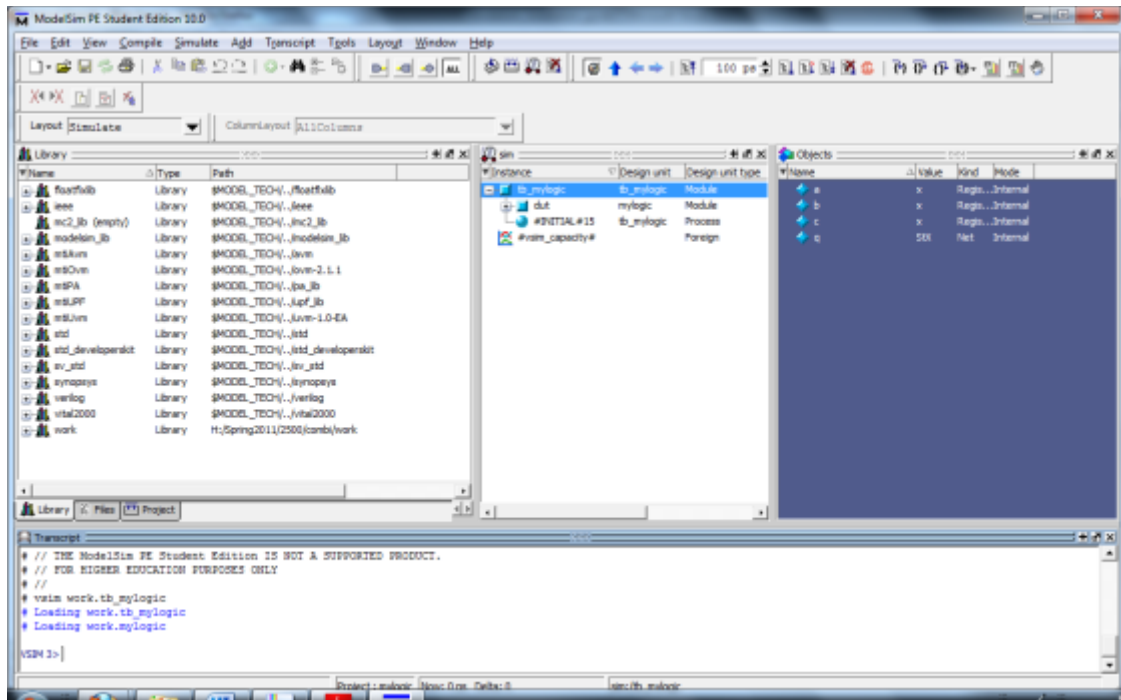
7. Click *Compile* → *Compile all*. You should see checkmarks appear after the file names, replacing the question marks that were present before. These indicate that the files were compiled successfully. You should also see the message “2 compiles, 0 failed with no errors” in the status window at the bottom.



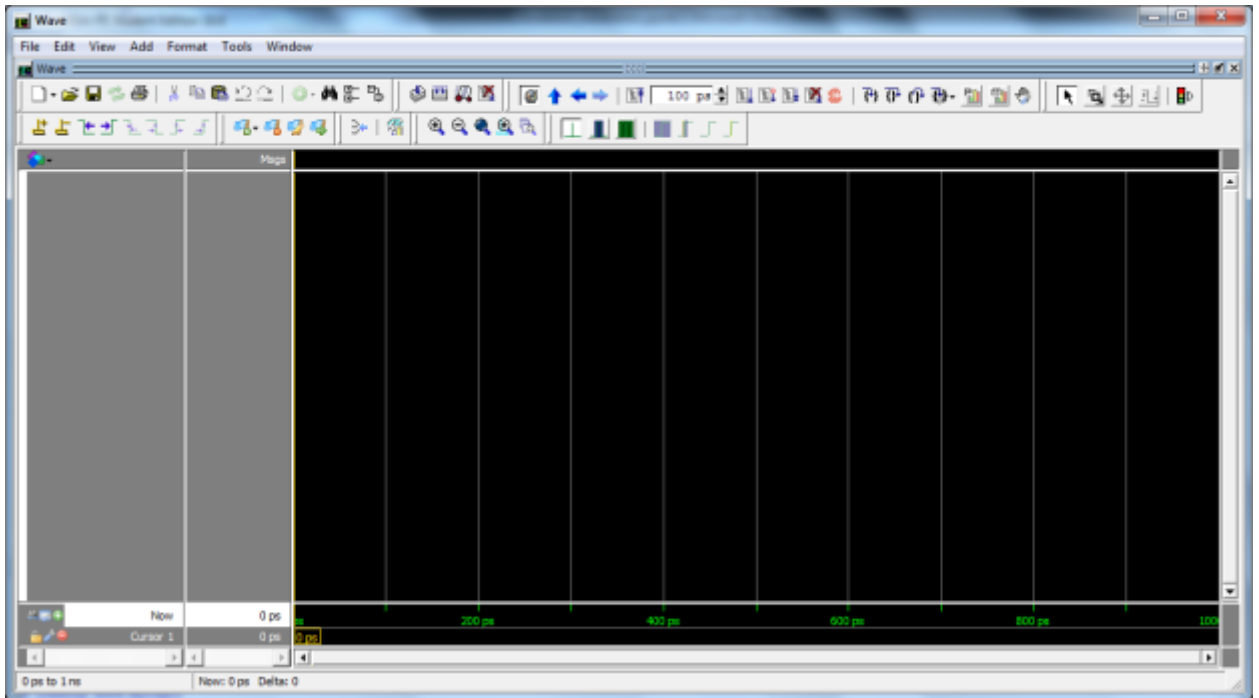
8. Click on *Simulate* → *Start Simulation*. In the new *Start Simulation* window that appears, select *work* → *tb\_mylogic* and click *OK*.



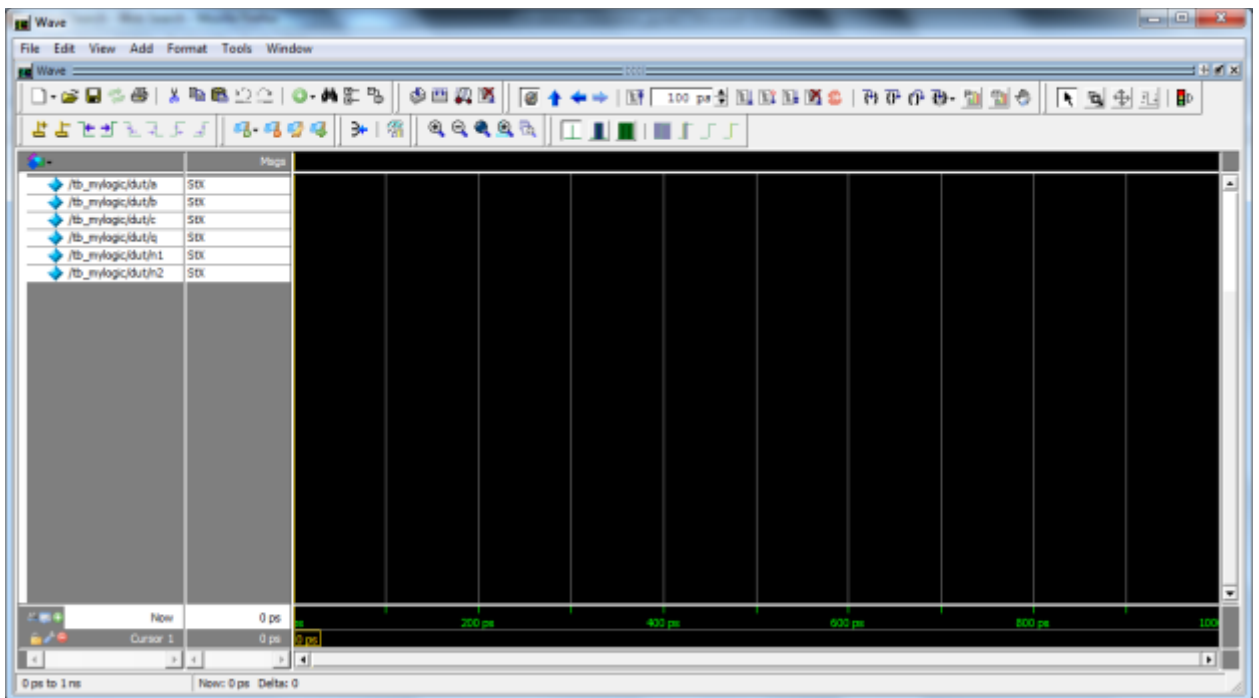
9. You should see something similar to the following. Your subwindow arrangement may be a little different. In the dark blue window, you should see the “ports” that are declared in *mylogic.v*.



10. Click *View* → *Wave*. A new window will open, where eventually you’ll be able to observe waveforms.

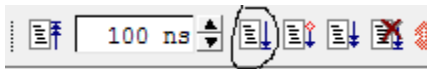


11. Go back to the main Modelsim window. Right-click on *dut* → *Add* → *To wave* → *All items in region*. It will add the internal “wires” from the design to the window. By the way, “dut” refers to “device under test”.



12. At the top of the wave window, find the tabs as shown below:

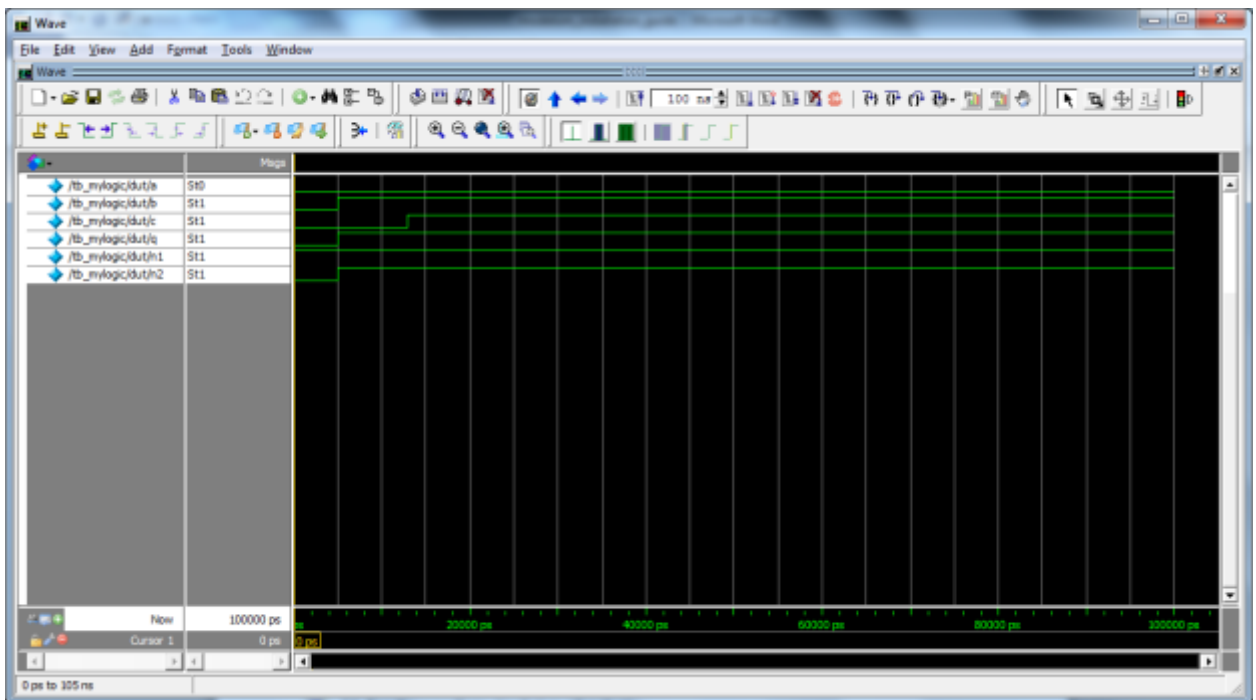




13. Change *100 ps* to *100 ns*. Click on the 1<sup>st</sup> tab to the right to *Run* your simulation. Click on *zoom full* on the tab at the top of the wave window:



14. You should now be able to see the functional simulation of *mylogic.v*. (The waveforms should look slightly different from those shown below.) Check the waveforms to see if the signal values are what you would expect for the inputs specified in the test bench.



15. To learn more, go to *Help* → *PDF Documentation* → *ModelSim PDF Bookcase* – *PE Student Edition* menu option. Select the *ModelSim Tutorial*. Refer to the tutorials to get familiar with the ModelSim tool.