Tutorial for DE0 - LT24 system

Step by step tutorial

1. Open the "DE0-Nano.qpf" project in "DE0_LT24_student" folder using quartus.

2. Open Qsys

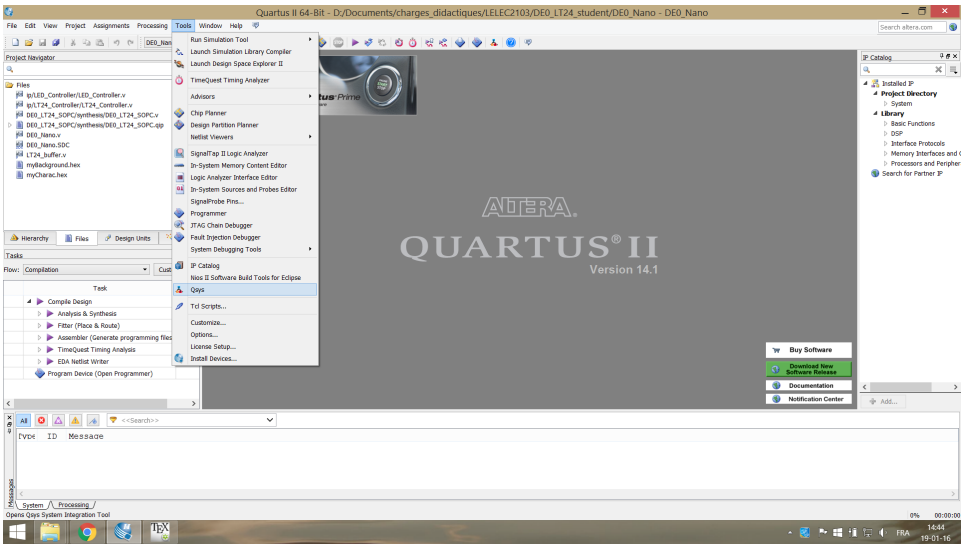

Figure 1: Point 2

3. When Qsys starts, open "DE0_LT24_SOPC.qsys".

4. Click on the "Generate HDL" button on the bottom right corner of the Qsys window. Then click on "Generate". Do not worry about the warnings.

5. When its done, close the "Generate window" and click on "Finish".

6. In Quartus, click on the "Start compilation" button.

7. When the project is compiled plug the LT24 on the Cyclone IV according to what is described in the "LT24 User Manual." Then plug your Cyclone IV to your computer via the USB cable and program the DE0 using the "Programmer" interface. Click on "Start". If it is done successfully, the FPGA is well programmed and contains the digital circuit. By the way, the screen should be white now :).

8. To program the software for the NIOS CPU on the FPGA, open "Tools - Nios II software builds tools for Eclipse".

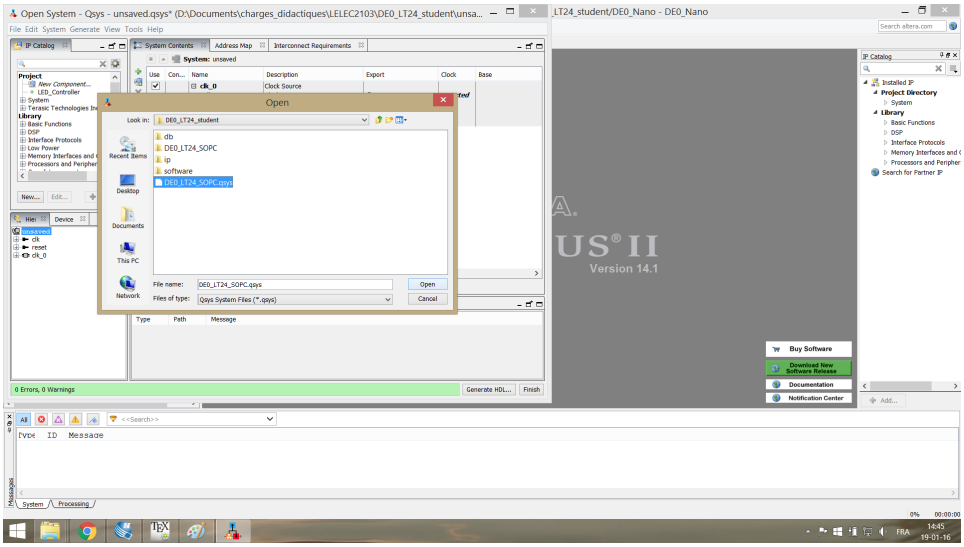

Figure 2: Point 3

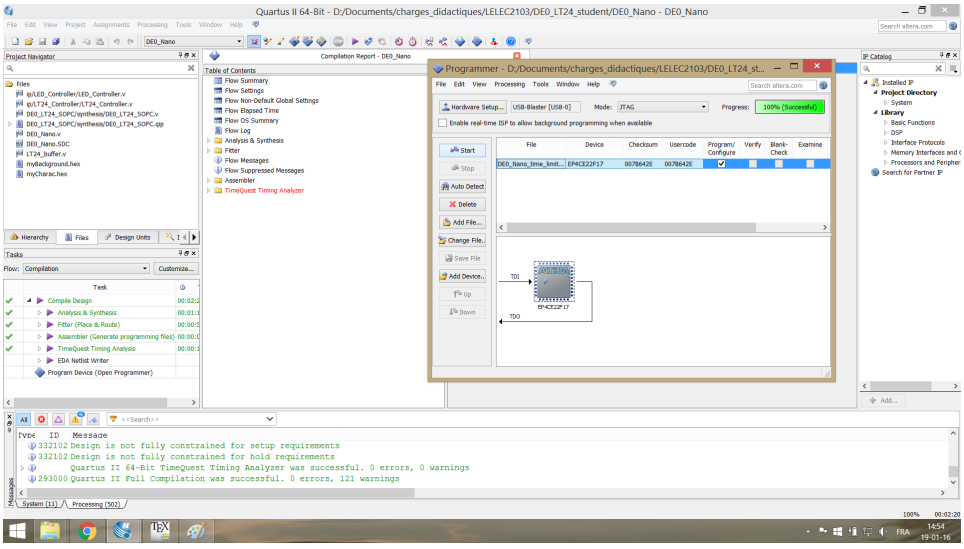

Figure 3: Point 7

9. Click "OK" for the workspace launcher.

10. Create a new project via File - New - Nios II Application and BSP from template.

11. Select the "DE0_LT24_SOPC.sopcinfo" file related to the project located in the "DE0_LT24_student" folder.

12. Name your project "software_LT24".

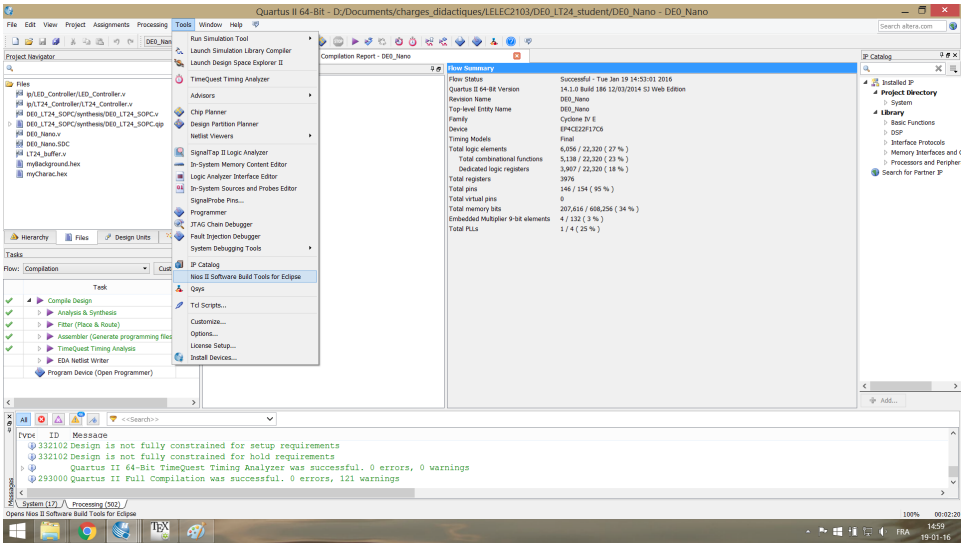

Figure 4: Point 8

13. Select the "blank project" template and click on "Finish".

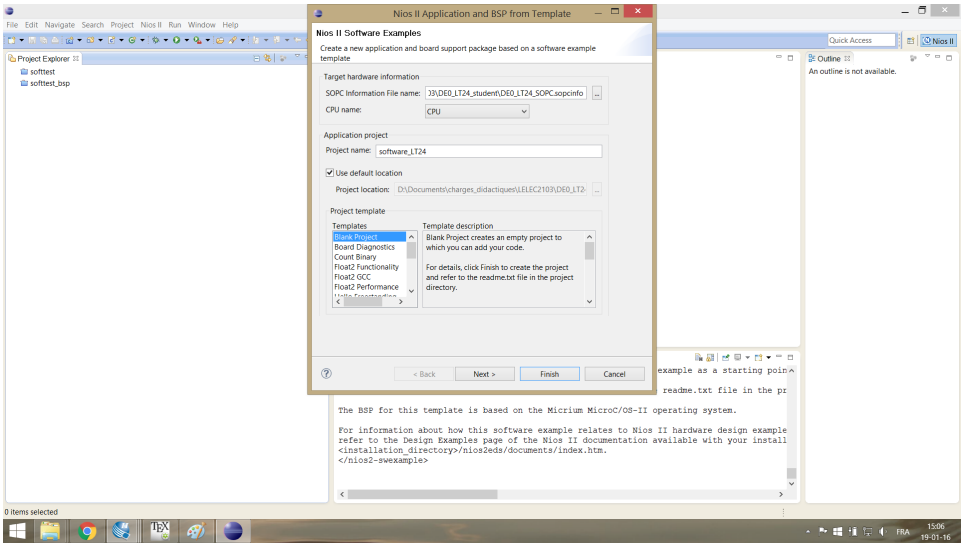

Figure 5: Point 13

14. Then, right click on the software_LT24 project in the project explorer and click on the "import" button in order to import the software files.

15. Choose "General - File System" in the import window.

16. Import the content of the "DE0_LT24_student/software/source" folder

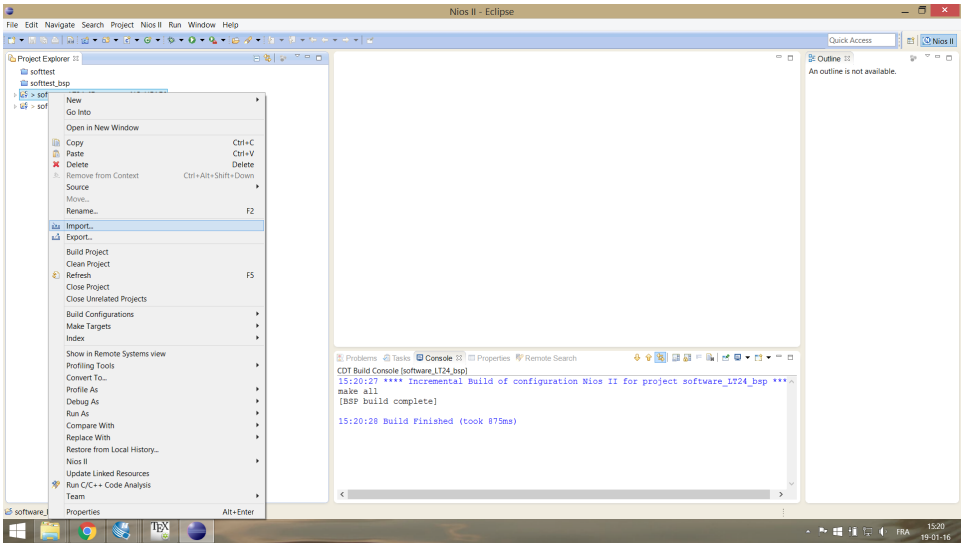

Figure 6: Point 14

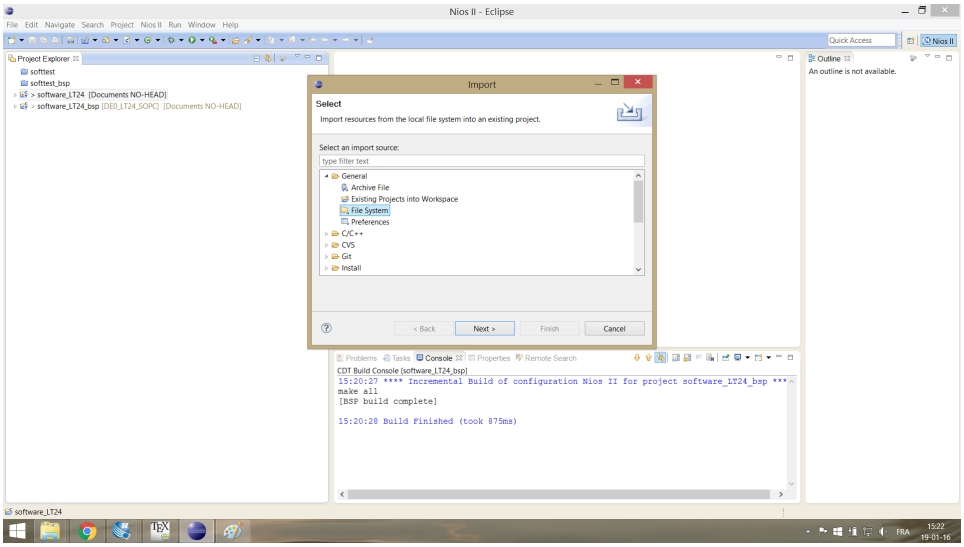

Figure 7: Point 15

into the project and click on "Finish".

17. Right click on the "software_LT24" project in the project explorer and click on "Build Project".

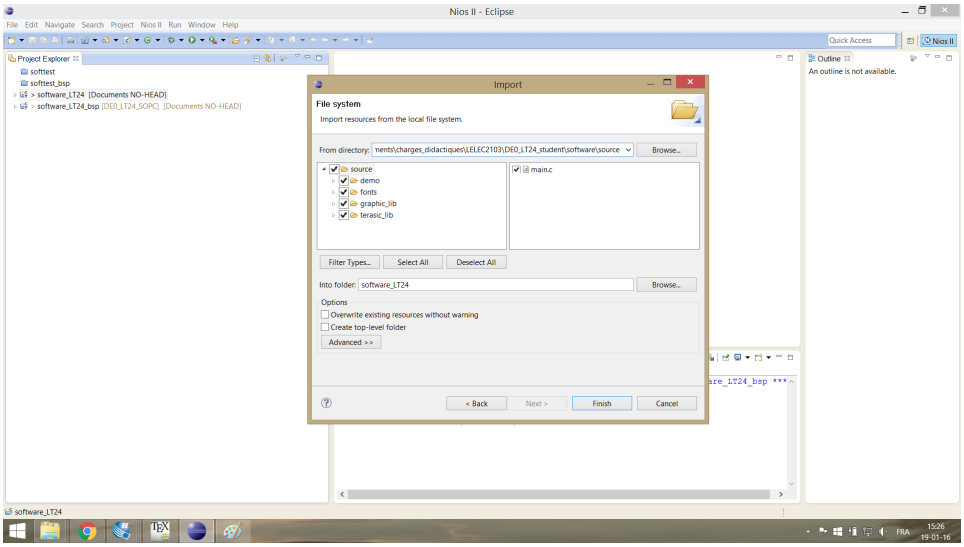

Figure 8: Point 16

18. When building is done, right click on the "software_LT24" project in the project explorer and click on "Run as - Run configurations" .

19. In the "Run configurations" window, click on the "Target Connection" tab and check "Ignore mismatched system ID" and "Ignore mismatched system timestamp". Then click on "Run".

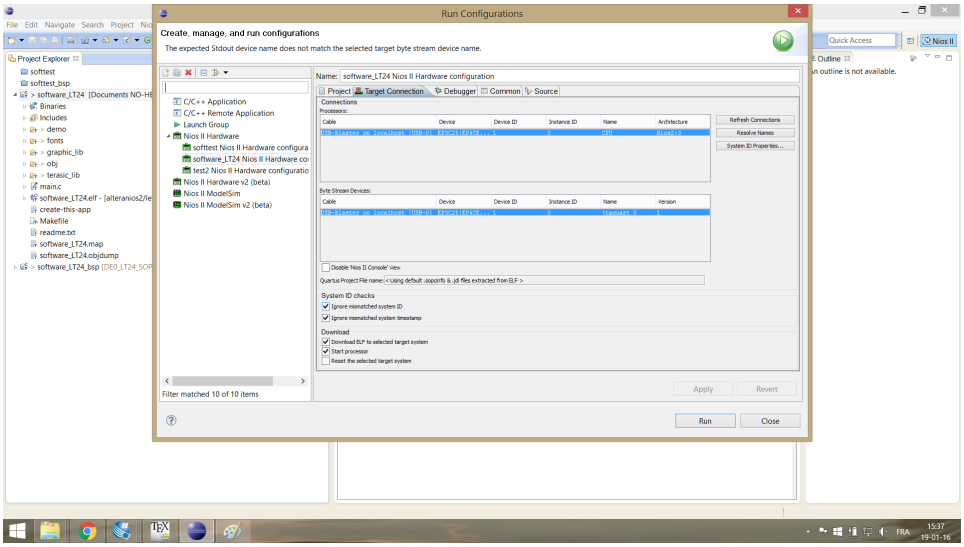

Figure 9: Point 19

20. If everything works, you see a wall of bricks displayed on the LT24

screen. When you touch it, a small character appears and follows the position of your finger :)