Project Objective

The main purpose of this project is

a. To learn how to design and implement the first embedded system using Intel Quartus Software
b. To develop the embedded application which will serve as a “Hello World” software using Nios Eclipse
c. The system and the application will be used as a base for the next projects

Project Requirements

a. Follow the guidelines that are posted in Module1/Labs to design the hardware system and create the application program
b. Make sure that both data and instruction cache of NIOS processor are set to **4KB** and Nios2 version is **Nios II/f.**
c. Before starting with the application project, you should have a successful compilation and a successful board configuration
d. After running the application program in Eclipse, you should get the message “Hello from Nios II” printed on Nios console

Project Report (**100%**)

The project report will be graded out of 100, and the points will be distributed as following:

a. **Professional preparation** (20 points):

   You are required to submit a typed document with text of the paragraphs in Times New Roman 12 pt font, clear and grammatically well-formed explanations, page numbering and document heading numbering (1.0, 2.0, 3.0, etc to identify the required sections listed below).

b. **Report Content** (80 points):

   1.0 (*20 points total, each value is 5 points*) After you compiled and synthesized your system, read the summary report from Quartus, and fill out the below table with the numbers from the report.

Logical Elements	Registers	Total Pins	Memory Bits

2.0 (*20 points total, each value is 5 points*) Change the version of Nios II processor from Nios II/f to **Nios II/e** in the platform design. Then, regenerate the new design and recompile the project. Read the summary report from Quartus and fill out the below table with the numbers from that report. **Note:** it is unnecessary to reconfigure the board and/or re-run the application project

Logical Elements	Registers	Total Pins	Memory Bits

3.0 (*20 points total, each value is 5 points*) Return the processor to **Nios II/f**. Set Nios II Cache Configuration on **4KB** for instruction cache and **16KB** for data cache. Then, regenerate the new design and recompile the project. Read the summary report from Quartus and fill the below table with the numbers from that report. **Note:** it is unnecessary to reconfigure the board and/or re-run the application project.

Logical Elements	Registers	Total Pins	Memory Bits

4.0 (*20 points*) Include a picture for one of the three running above, which shows the “Hello World Message!” in Eclipse.

Project Submission

1. Save the project report as **p1_username1_username2.pdf**, username of both students in the group.
2. **Only one attempt** is allowed
3. **Only one group member** submits the project
4. **Remember:** Any grade dispute must be raised within one week of the grade posting.