Indian Institute of Technology Guwahati
Department of Computer Science and Engineering
CS223 Hardware Lab

Assignment 1

Date of Announcement 3rd Jan 2014
Demo Date: 17th Jan 2014
Weightage of this assignment is 18% out of 100.
Experiment 1: **(9 Hour) Experiment with Digital Components**

(a) [30% Mark] Demonstrate functionality of a 4 bit ALU chip using bread board. You are allowed to use 7 segment LED and driver to show/demonstrate the output.

Some ALU operations require two operands of 4 bit, you can assume/provide a fix value for an operand (Ex 2+A, 2-A, here 2 is a fixed number and A is an input).

(b) Design VHDL model and simulate for the bellow given components in Xilinx ISE and finally download your design to Spartan 6 FPGA board.

1. [10% Mark] 4x16 decoder
2. [15% Mark] 4 bit and adder/substractor
3. [45% Mark] 4 bit ALU with 4 control input (similar to ALU chip available in our Lab)

You can interface one or two register to store inputs for your design.

You can take help from TAs. All the TAs and Instructor of CS223 will be available in lab timing. You can ask TAs or Raktajit Pathak about license and installation of ISE software. Bread board and required ICs may be issued from Hemanta Nath.