

King Fahd University of Petroleum and Minerals
College of Computer Sciences and Engineering
Department of Computer Engineering

COE 202 – Fundamentals of Computer Engineering (T101)

CAD Assignment # 01 (due date & time: Sunday 09/01/2011 during class period)

***** Show all your work. No credit will be given if work is not shown! *****

1. Using the “*LogicWorks*” tool, build a 1-bit full adder/subtractor that is made of **only NOR gates**. Label all inputs as well as all of the outputs of the 1-bit full adder/subtractor.
2. Using the “*LogicWorks*” tool and using the 1-bit full adder/subtractor that you have built in step (1), build a 4-bit ripple-carry adder/subtractor. Label all inputs as well as all of the outputs of the 4-bit ripple-carry adder/subtractor. Use **two** “*Hex Keyboard*” devices under the “Simulation IO” library to connect to the inputs of your circuit instead of using “*Binary Switches*.”

Save your circuit and name the file “*CAD01_yourStudentID.cct*”.

Deliverables:

1. Send a soft copy of your circuit file to both myself (marwan@kfupm.edu.sa) and the grader (khadir@kfupm.edu.sa) with the “subject” line being “*COE202-CAD01-yourStudentID*”.
2. On the due date, submit a printout of the circuit window. Make sure that the entire circuit appears in the printout.
3. On the due date, submit a printout of the timing window after applying the following test cases:

0011 + 0011
0101 + 0001
1001 + 1111
0111 - 0001
0100 - 0011
0010 - 0110

Make sure to zoom-in as far as you can inside the timing window before printing. Also, make sure that both the sets of inputs and the sets of outputs show up in the printout.