Oregon TECH

Computer Systems Engineering Technology
CST 345 – HW/SW Co-Design

Take Home Final
Winter 2015
Instructor: Troy Scevers
Possible Points: 100

Name_____
Due Date: Wednesday, March 18th @ 5pm

Deliverables

1. Demonstration of working thermostat system running on Nexys 3 board with MicroBlaze processor.
2. Formal Lab writeup covering this design problem
3. Zip up all design files, lab writeup, etc. and upload to blackboard

Design Problem

You are to create a digital thermostat system. You will use a combination of the Nexys 3 board and a couple of PMODs to accomplish this. We will be using the following devices: Nexys 3 dev board, Muxed displays, LEDs, toggle switches, Keypad PMOD and a Temp Sensor PMOD (PmodTMP2).

You will design a digital thermostat system. When all switches are off the system will display the current temperature of the sensor. If the temperature gets above a set point then you will turn on the airconditioning (Simulated by an LED). If the temperature gets below a set point you will turn on the heat (also simulated by an LED).

One switch will turn on configuration mode. In configuration mode we can set the high and low points. A second switch will choose whether we are setting the high or low. Use the keypad to enter these values in whole numbers. Pressing an E on the keypad will work as an enter to save the value as new setpoint. Pressing C will clear it.

A third switch will be a display mode for the set points. Again using the same switch as above.