

CSE 490/590

Summer 2017

BASYS 3 Board Project #2

Electronic Lock

Design an electronic combination lock. A four digit code can be entered by using the pushbuttons and slider switches as in Project #1. After the number has been entered, the user should press momentary push button C (center) to indicate that the code entering is complete. When the correct combination is entered and the device unlocks, the LEDs will flash. If two attempts are made to unlock the device without correctly entering the combination, the device should be deactivated for 10 seconds. The seven segment display will be used to display the state of the lock. The states are: LOC (locked), UnLC (unlocked), and PAUS (deactivated). When the device is unlocked, it can be locked by pressing momentary push button L (left). The entire code must be entered within 30 seconds (from the first button press to the last button press). The combination for your lock should be the number of digits in your username, followed by 5 if you are in CSE 590 or 4 if you are in CSE 490, followed by the sum of the first two digits. For example, if your username is *csestaff* and you are in CSE 490, your combination would be 8412.

Guessing Game

Design a two player guessing game. The game starts with the four digit seven segment display illuminated with "PL 1" indicating that player #1 should enter a number between 0x0000 and 0xFFFF. The number is entered using the procedure outlined in Project #1. After the number has been entered, player #1 should press momentary push button D (down). The seven segment displays are used to indicate this by displaying "PL 2". It is now player #2's turn. Player #2 repeatedly enters four digit numbers until he or she correctly guesses the number entered by player #1. The procedure for entering the four digit number is the same as it was for player #1. When an incorrect number is entered, the display should indicate if the guess was too high ("2 HI") or too low ("2 LO"). When the correct guess is entered the LEDs should blink in celebration, and the number of guesses required should be displayed on the seven segment display.

Calculator

Design a calculator. The first operand is entered using the procedure outlined in Project #1. After the first operand is entered, the second operand can be entered. After the second operand has been entered, the user can select the operator by pressing momentary push button L (left) for addition, R (right) for subtraction, or D (down) for logically left shift operand 1 by the count represented by operand 2. If the user would like to enter another set of numbers, momentary push button U (up) should be pressed to clear the display (all zeros) and start over.

Your Own Design

If you desire, you may come up with your own project, but your idea must be approved by Dr. Schindler. Your idea must be submitted for approval in writing to Dr. Schindler. You will receive email indicating whether your proposal was approved. If it was not approved, feedback will be provided so you can amend your proposal and resubmit.