CSE321 Project 2

Assigned: September 20, 2020
Project Due: October 18, 2020, 11:59 pm ET
Project Close: October 19, 2020, 11:59 pm ET

Objective:
You will be implementing an embedded system. Specifically, you are going to make a basic security system.

THIS IS AN INDEPENDENT PROJECT!

A score of at minimum 50% must be earned to maintain eligibility to pass the course.

Problem:
Design a security system that locks or unlocks based on a 4 digit code.

Constraints/Specification Requirements:
- 4 digit code = last 4 digits of your person number
- Code entered via matrix keypad
- Everytime a value is entered, an LED lights up
- When 4 values are entered it will lock or unlock
- Lock/unlock mode will display on the LCD
- Must have a response of some kind if the wrong code is entered
- Must run “forever”
- BONUS: Add in a password reset to allow user to restart entering their password at any point
    - 10 Points for inclusion in Documentation
    - 10 Points for Code
    - 10 Points for implementation

Implementation Method Requirements
- All registers need to be controlled bitwise
    - No API other than using provided LCD Libraries
        - Libraries coming soon (long story)
    - You are allowed to use delay functions
- Bounce needs to be addressed
- Have at least 1 interrupt and ISR

- Proper commenting

Submission and Evaluation:
There are multiple parts to this project that you will be evaluated and require different submission methodologies.

1. Development Process (20 Points)
    a. This is your commits
        i. 1 commit with at minimum a complete header by 9/27 (10 Points)
        ii. 1 commit with progress by 10/9 (10 Points)
        iii. Final commit due with project
2. Documentation (120 Points)
    a. Table of Contents for your work
        i. Cover Page
        ii. Specifications
        iii. Features
        iv. Applications
        v. Block Diagram
        vi. Functionality Diagram
            1. ASM, FSM State Diagram, or Flow Chart pick 1
        vii. BOM
        viii. Schematic
        ix. Test Plan
3. Code (150 Points)
    a. Code will be evaluated for
        i. Commenting (30 Points)
        ii. Implementation technique requirements (60 Points)
        iii. Functionality (60 Points)
            1. Yes partial credit is a thing
4. Implementation (150 Points)
    a. This will be done with a live demo that you schedule
        i. Note if your code doesn't work, you can't get these points
        ii. A sign up will be done for you to select a time on 10/18 or 10/19
        iii. 15% overall score penalty if demo is not done
    b. Runs (10 Points)
    c. Keypad (30 Points)
        i. Causes a response of some kind (20 Points)
        ii. Bounce addressed (10 Points)
    d. LEDs (30 Points)
    e. LCD (30 Points)

f. Wrong Response
g. Functionality (50 Points)

Detailed Grading Rubric and Submission Instructions Coming Soon