CS443/543 - Embedded Systems

Assignment #8
Fall 2025

The purpose of the assignment is to implement a combination lock, including a lock/unlock mechanism using the servo motor included in your parts kit. It is probably helpful to install one of the levers included with the servo onto the servo motor shaft, so you can better see the position of the servo. Also, install three LED's to indicate the state of the lock - use a red, a green and a yellow LED.

The combination lock should operate as follows:

1. Initially, the lock should be open - i.e., the servo should be in the unlock (0 rotation) position..

2. Pressing the 'A' key on the keypad should close the lock - the servo motor should move to the 180 degree position, and the red LED should light, to indicate that the lock is closed. The combination lock should ignore any other digit that is pressed when the lock is open.

3. To Open the lock, use the keypad to type in a four digit number. You can choose the number that you want to use to open the lock. As soon as the first number is entered, the yellow led should light, indicating that a number is being entered to open the lock.

4. If the correct four digit number has been entered, the green LED should light, and the servo motor should move to the open position.

5. If the incorrect number is entered, the red LED should turn on, and the servo should not move.

6. In either situation, the combination lock should be ready to accept either an 'A' to close the lock if it is currently open, or be ready to accept another four digit number.