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CS/EE 120B
Section: 026

Custom Project Description

For my custom project I have made a home security system that incorporates 4 buttons, 1 switch, 6 LEDs, a speaker, a photoresistor, an LCD display and a keypad.

The user starts in the Disarmed mode and has two options for the Armed mode, Stay (accessed using pin: 123*) & Away (accessed using pin: 123#).

The Stay [Armed mode] only detects for an alarm trigger (switch), the system can change to the Disarmed mode using pin: 1230 only if the alarm has not been triggered.

The Away [Armed mode] detects for an alarm trigger (switch) and detects how dark it is outside the household (using photoresistor), the system can change to the Disarmed mode using pin: 1230 only if the alarm has not been triggered. When the outdoor environment is semi dark, the system turns on the outdoor lights (white LED). When the outdoor environment is dark, the system turns off the outdoor lights (white LED) and turns on the indoor lights (blue LED). Such change of outdoor lights (white LED) and indoor lights (blue LED) occur according to the light levels outside the household (Bright: Red, Orange, Yellow, Green LEDs, Semi Bright: Orange, Yellow, Green LEDs, Semi Dark: Yellow, Green LEDs, Dark: Green LED) and are used to make it seem as though someone is at home. If the alarm has been triggered, the mode is changed to the Potential Intruder mode and remains in the Potential Intruder mode for 10 seconds.

During the Potential Intruder mode, the user has 10 seconds to either press buttons 2 or 3 (4 buttons) to go to the Distress mode or press buttons 1 and 4 simultaneously (4 buttons) to reset the system. If the 10 seconds pass or a wrong combination of buttons are pressed during the 10 seconds, then the mode changes to the Intruder mode.

When the alarm is triggered (using switch) the mode is changed to Intruder mode, only if the previous mode was Stay [Armed mode], the 10 seconds in the Potential Intruder mode have passed or an incorrect combination of buttons (4 buttons) were pressed during the Potential Intruder mode, having the outdoor lights (white LED) and indoor lights (blue LED) turn on along with outputting a constant high-pitched sound (using speaker). In order to reset the system, the user must press the first and fourth buttons simultaneously (4 buttons).

During the Distress mode the display shows the Disarmed mode message, in order to make the intruder believe that the alarm was not triggered, and turns on one of the four light meter LEDs (Red LED) to indicate that the police has been called. In the Distress mode the system waits to be changed to the Disarmed mode using the pin: 1230.

Once the system has been reset the mode is changed to Reset mode, which has two of the four light meter LEDs turned on (Red LED & Green LED) in order to demonstrate that the system has been reset but not disarmed. In order to change the system to the Disarmed mode the pin:

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1230 must be inputted. When disarmed, the two of the four light meter LEDs are turned off (Red LED & Green LED).

When a correct key is pressed (using keypad) the display (LCD display) shows the current mode's message along with the character '*' below the current mode's message per correct key entry. When a key entry is incorrect the display (LCD display) clears the screen and only shows the current mode's message.

When in the Disarmed mode the display (LCD display) shows the message "Disarmed".

When in the Stay [Armed mode] the display (LCD display) shows the message "Armed - Stay".

When in the Away [Armed mode] the display (LCD display) shows the message "Armed - Away".

When in the Potential Intruder mode the display (LCD display) shows the message "Potential Intruder".

When in the Intruder mode the display (LCD display) shows the message "Intruder".

When in the Distress mode the display (LCD display) shows the message "Disarmed".

When in the Reset mode the display (LCD display) shows the message "System Reset".

For my custom project I was able to implement everything I had proposed (170/200 pts) and I was able to implement your suggestion of the Potential Intruder mode & the Distress mode (15/200 pts). Unfortunately, I was unable to figure out how to implement custom characters (10/200 pts) and how to implement either EEPROM or 4 bit LCD (5/200 pts).