Room Monitoring System

Introduction

With the Coronavirus pandemic still very much a problem, practicing social distancing and staying away from others is especially important. However, this is difficult to do in enclosed and crowded areas.

Here is where the Room Occupancy Counter can help. It keeps track of the number of people in a room or building by increasing a counter when people enter and decreasing the counter when people leave. Once the number of people in an area surpasses the maximum number of people allowed (which can be set by the user), an alarm will go off until the number of people is within bounds again.

This can prevent buildings and rooms from being over crowded, which can help to limit the virus's spread by making social distancing easier to practice.

Formal Description:

1- A counter is required to count people entering and leaving a room. The room has a separate entrance and exit. Sensor detects people entering and leaving. Up to **seven** people are allowed in the room at one time.

2- The number of people in the room is shown on a seven segment display.

3- Using three LED lights, one indicates that the room is empty, and one indicates room is full and one to indicate that the room have people but not full.

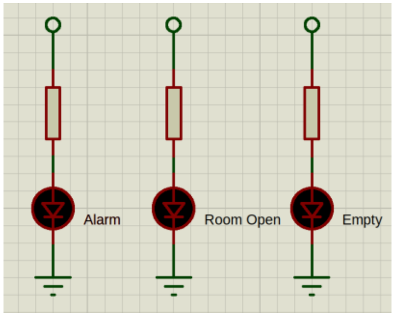
4- For input buttons, entering and leaving, choose push buttons.

Instructions:

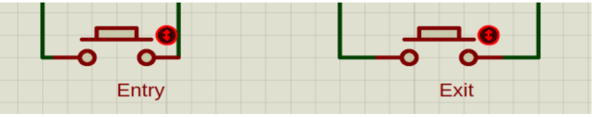
1- In proteus build a circuit that will have

a. The ATMEGA32 Microcontroller.

b. A seven segment display that will show the number of people inside our room.



c. 2 Push buttons that will emulate the entry and exit sensors (e.g when pushbutton 1 is pressed this means the one person have entered the room while when Push button 2 is pressed this means that one person have left the room).

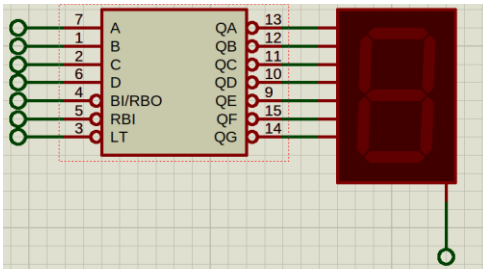


d. 3 LED

i. A Red LED that will be on when the number of people inside the room is at the maximum.

ii. A Green LED that will be on when the room is empty.

iii. A Blue LED that will be one when the number of people inside the room is greater than zero and less than the maximum.



2- Write the embedded C code of the system.

3- After successfully compile your program and download it to proteus to verify it

(Hint: Use interrupts for the entering and leaving pushbuttons).