



The Fire Alarm Challenge (simplified)

You are to build and program a fire alarm. The fire alarm will have two pull boxes, one on each floor. There is also a Piezo speaker for the alarm. The terminal is used to display the state of the system as follows:

“System Normal” is displayed when all is well.

“First Floor” is displayed if the first floor pull box has been activated.

“Second Floor” is displayed if the second floor pull box has been activated.

How it functions:

Button 1 represents a “pull box” on the first floor.

Button 2 represents a “pull box” on the second floor.

Each of the buttons is connected to a different pin on the microprocessor.

When there is a fire, someone pushes button 1 or button 2. That begins the alarm cycle. There is no supervisory current loop.

Requirements:

1. When no button has been pressed, a steady green light indicates all is well. “System Normal” is displayed on the terminal.
2. When button 1 is pressed, “ First Floor” is displayed on the terminal, the green LED goes off, a red led blinks and an alarm sounds intermittently. (Beep, Beep, Beep, ...)
3. If button 2 is pressed,“ Second Floor” is displayed on the terminal , the green LED goes off, a red led blinks and an alarm sounds intermittently.
4. If you wish to do so, you may substitute a single bicolor LED for the red and green LEDs mentioned above, assuming it displays as indicated above. You MAY add a reset button, but that is not necessary. Once the system enters an alarm state you reset it by simply reloading the program.

Summary:

Normal State: Green led is on, “System Normal” on the terminal, no audible alarm.

Alarm State: Green led is off, Red LED is blinking, alarm sounds intermittently, Terminal indicates which pull box has activated the alarm.