Smart Motion-Activated Alarm System with Light Sensor (Devaughn Henry)

Project Overview

This project is a smart motion-activated alarm system built using an Arduino Uno. It uses a PIR sensor to detect motion, a photoresistor to activate the system only in the dark, and an LCD screen to display real-time status updates. A buzzer and LED alert the user when motion is detected. The goal was to simulate a real-world security system using sensors and logic controls, demonstrating basic embedded systems design.

What I learned

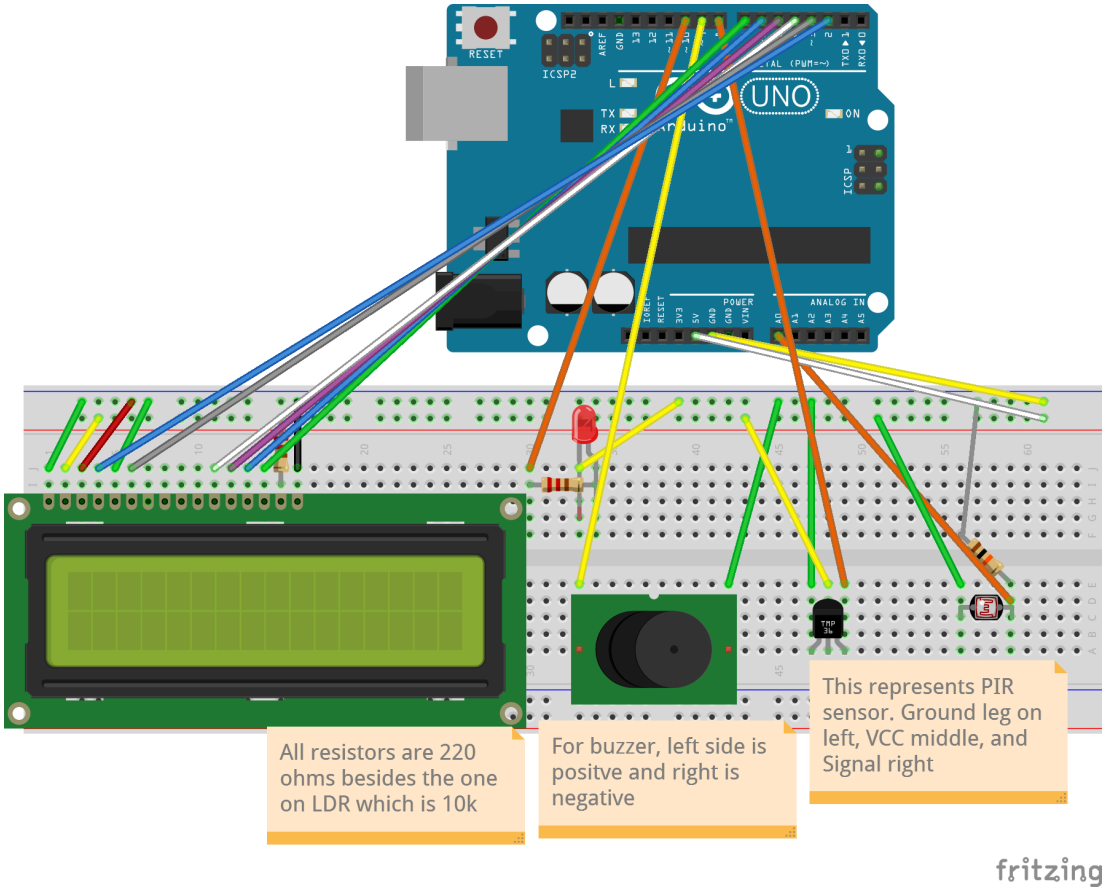
- How to use digital and analog pins on Arduino.
- How to read sensor input and use it in conditional logic
- How to prevent screen flicker and optimize UI on an LCD screen
- How to create a timed output pattern with a buzzer (like an alarm)
- How to understand Arduino code

Components Used

Arduino Uno
PIR sensor
Photoresistor (LDR)
Buzzer
Red LED
LCD 16x2 Screen
2x 220 Ohm Resistor (1 for LED, 1 for screen)
1x 10k Ohm Resistor (For LDR)
Jumper Wires

Breadboard

Circuit Diagram



Code Snippet

```
if (isDark) {
  if (motion == HIGH && lastMotionState != HIGH) {
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("Motion Detected!");
```

**View the full program here:
https://github.com/princevaughn123/Smart-motion-alarm/blob/9841a6927ffc91b39cad682e2b86289409ae59a5/REALSMARTHOMEARDUINO.ino

Photos/Video Demo

https://drive.google.com/drive/folders/1gW55CZfkrAb-psR9fl9EmGbHIc6nywHf?usp=drive_link

Future Improvements

- Add a keypad to arm/disarm the system
- Add bluetooth or WI-FI for remote alerts
- Log motion events to an SD card