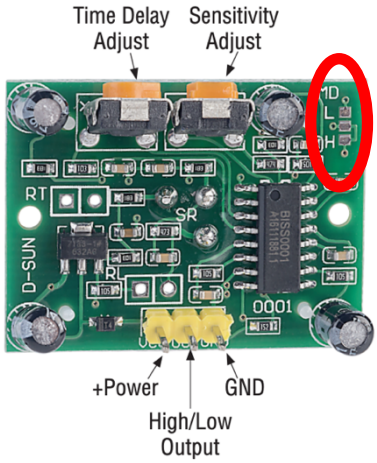
The Summer Experience: Build a burglar alarm

Kit contents:

- Arduino Uno R3 x1
- Male to Female jumper wires x5
- Red LED x1
- PIR motion sensor x1 – datasheet[1]
- USB A to USB B cable x1
- USB C to USB A adapter x1
- This instructions sheet!



Assemble the hardware:

- Put an LED in the Arduino board by putting the positive (long) leg into pin 13, and the ground (short) leg into the adjacent GND pin.
- Using jumper wires, connect the positive (long) leg of the buzzer into a digital pin (e.g., pin 3) and the short leg into a GND pin.
- Using jumper wires, attach the power (+power) pin of the PIR sensor into the 5V header on the Arduino Uno, the ground pin to a ground (GND) pin, and the high/low output to a digital pin in, (e.g., pin 2).
- The PIR sensor has two modes, which are determined by the jumper (marked by a red circle on the image). With the jumper over the pin marked H the sensor is in re-triggering mode – the output pin is HIGH whenever the sensor detects movement. With the jumper over the pin marked L the sensor is in blocking mode – the output pin is HIGH for 2.5 seconds when it detects movement.
- Set the PIR sensor to L by moving the jumper (if necessary).

Upload the 'sketch':

- Code for an Arduino is called a 'sketch'. It is written in a variant of C++, typically in the Arduino IDE. This is already on your laptops.
- We have provided some example code that will set up your LED, buzzer, and motion sensor.
- It will work out the box – you just need to upload it on to the Arduino.
- To do so, plug your Arduino into your computer. Go to 'tools', then 'board', and select Arduino Uno. Then go to 'tools', 'board', and select the available port with your Arduino on it.
- You can then upload our example sketch by pressing the right arrow (labelled 'upload) in the top left of the Arduino IDE.
- When the PIR sensor detects motion, it sets it output pin to HIGH. In our code, this triggers the LED and buzzer.

Stretch activities:

- Try changing the tone of the buzzer by adjusting the number in tone(buzzer, 1000). You can get it to play music!
- Can you change how it activates? If you change the mode of the buzzer by moving the jumper across to H, how can you change the code to work with the new mode?
- What are some applications you can think of with this? How can you code it up?

[1] https://static.rapidonline.com/pdf/74-1108_v2.pdf