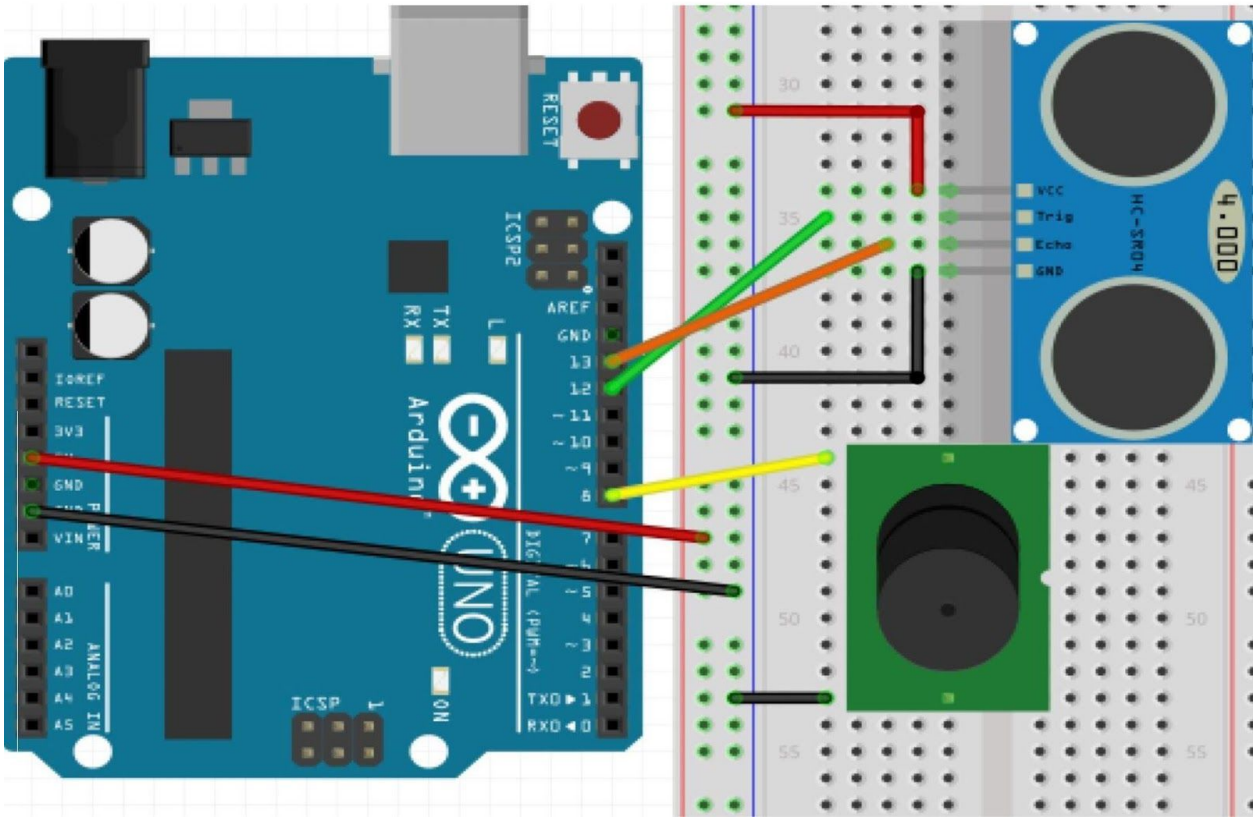
Exercise 7: Motion trigger alarm

In this exercise, you'll build an alarm that goes off when it detects an object nearby. Once you've built the system, try changing the distance and alarm parameters to see what changes. You can also open a *Serial Monitor* (the magnifying glass icon in the upper right of the Arduino IDE) to view the exact distance the sensor is detecting and feeding as inputs into the Arduino. Move your hand closer and further away to see how the number changes. This is the same technology that powers alarm systems for homes and businesses.

Step 1: Assemble the Arduino and breadboard.



Parts needed:

Arduino beard

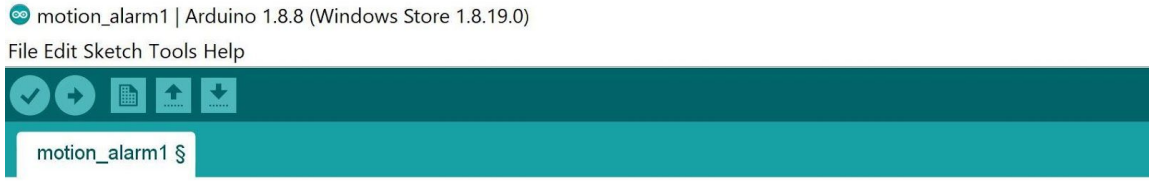
Bread board

1 HC-SR04 sonar sensor

1 active buzzer

8 jumper wires

Step 2: Program the Arduino.




```
#define trigPin 12
#define echoPin 13
int Buzzer = 8;// Connect buzzer pin to 8
int duration, distance; //to measure the distance and time taken

void setup() {
        Serial.begin (9600);
        //Define the output and input objects(devices)
        pinMode(trigPin, OUTPUT);
        pinMode(echoPin, INPUT);
        pinMode(Buzzer, OUTPUT);

}

void loop() {

    digitalWrite(trigPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(trigPin, LOW);
    duration = pulseIn(echoPin, HIGH);
    distance = (duration/2) / 29.1;
   //when distance is greater than or equal to 200 OR less than or equal to 0,the buzzer and LED are off
  if (distance >= 200 || distance <= 0)
        {
        Serial.println("no object detected");
        digitalWrite(Buzzer,LOW);

        }
  else {
        Serial.println("object detected \n");
        Serial.print("distance= ");
        Serial.print(distance);  //prints the distance if it is between the range 0 to 200
        tone(Buzzer,400); // play tone of 400Hz for 500 ms

  }
}
```