Assignment 2

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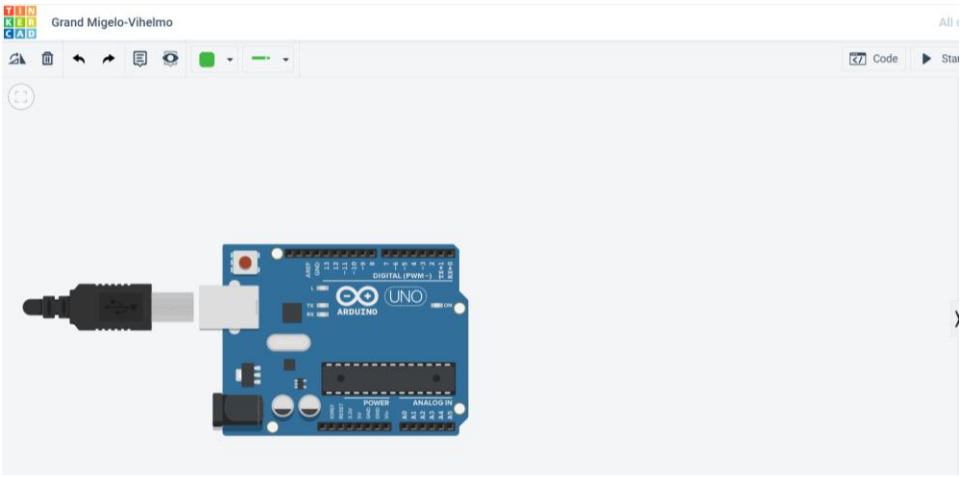
Duration: 1 Hrs

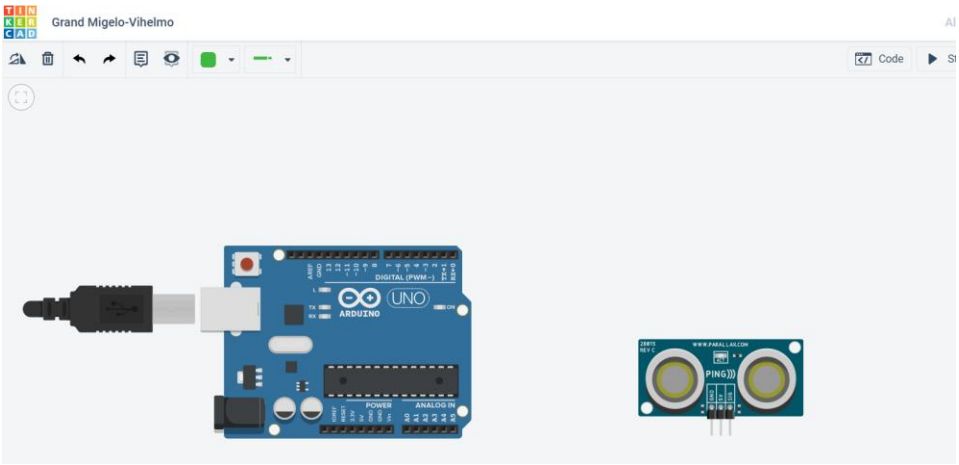
Objective:

Develop an "Automatic garage door opening system". Use an Ultrasonic sensor to detect if there is a vehicle in front of the garage. if any vehicle is detected open the garage door (rotate the servo motor) for some time and close it.

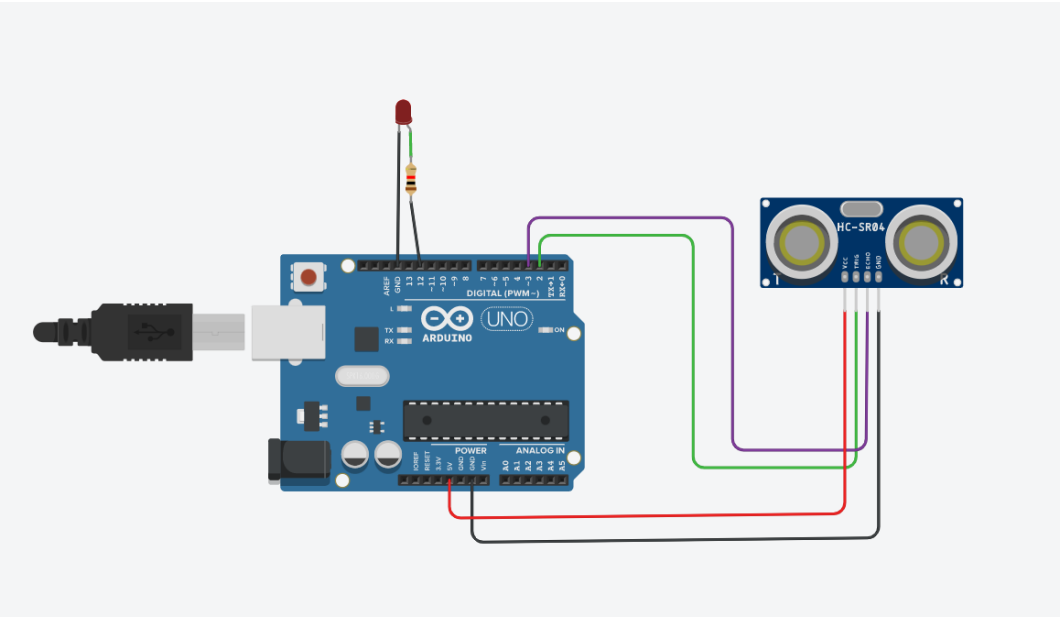
Procedure:

Firstly, we start with integrating an Arduino UNO board integrating with ultrasonic sensor and led light as shown below:





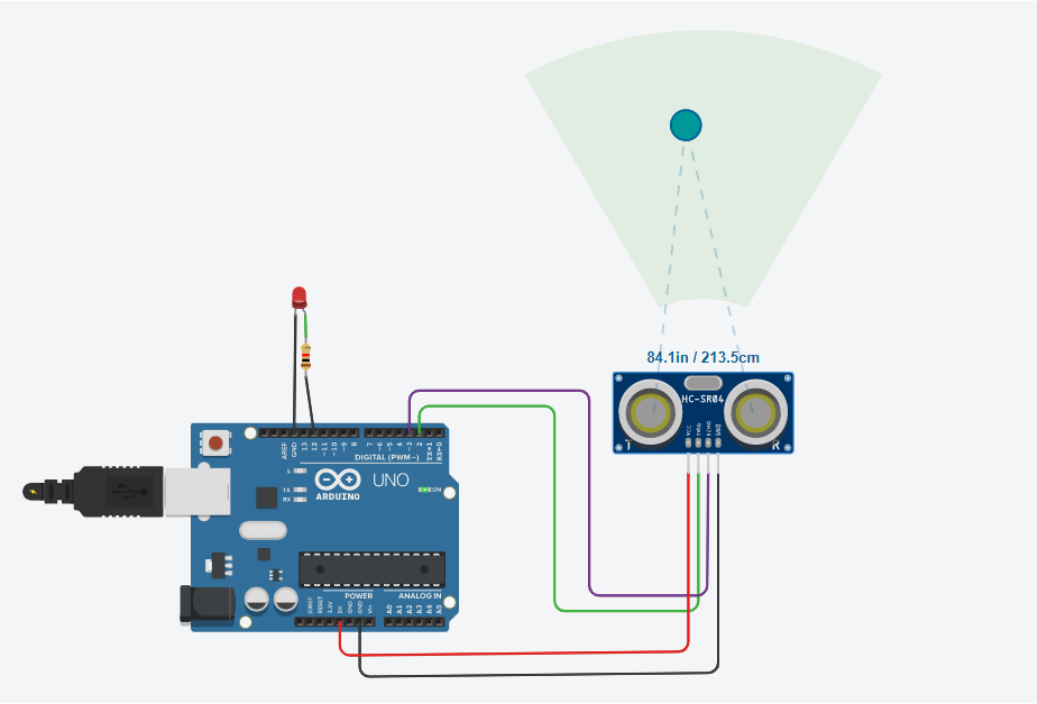
Final circuit is shown below:



Output:

When the vehicle comes in range of garage i.e. distance < 329:

As an output the sensor detects the distance and accordingly since the vehicle is in range the LED Bulb starts to blink (instead of this in real life door of garage will open) as shown below:



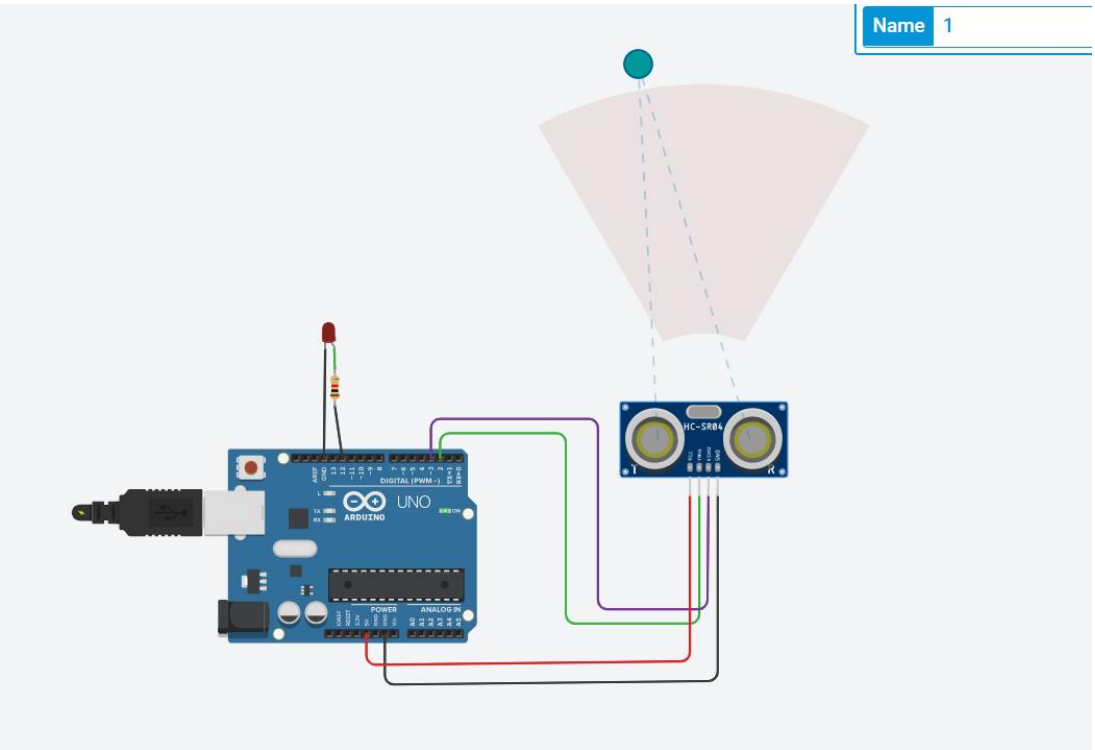
```
  Serial.begin(9600);
}

void loop()
{
  digitalWrite(2, LOW);

  digitalWrite(2, HIGH);
  delayMicroseconds(20); // Wait for 10 microsecond(s)
  digitalWrite(2, LOW);
  int dur=pulseIn(3,HIGH); // pulsein used for getting duration
  int distance=(dur*0.0343)/2;
  Serial.print("Distance in cm: ");
  Serial.println(distance);
  if(distance<329){
    digitalWrite(12, HIGH);
    delay(1000); // Wait for 1000 millisecond(s)
```

Serial Monitor

```
Distance in cm: 269
Distance in cm: 269
Distance in cm: 269
Distance in cm: 269
Distance in cm: 269
Distance in cm: 212
Distance in cm: 212
Distance in cm: 212
```

When the vehicle is not in range of garage i.e. distance >=329:

As an output the sensor detects the distance and accordingly since the vehicle is not in range the LED Bulb remains close and does not blink (instead of this in real life door of garage will remain close) as shown below:



```cpp
// C++ code
//
void setup()
{
  pinMode(2, OUTPUT);
  pinMode(3, INPUT);
  pinMode(12, OUTPUT);
  Serial.begin(9600);
}

void loop()
{
  digitalWrite(2, LOW);

  digitalWrite(2, HIGH);
  delayMicroseconds(20); // Wait for 10 microsecond(s)
  digitalWrite(2, LOW);
  int dur=pulseIn(3,HIGH); // pulsein used for getting duration
  int distance=(dur*0.0343)/2;
  Serial.print("Distance in cm: ");
  Serial.println(distance);
  if(distance<329){
    digitalWrite(12, HIGH);
    delay(1000); // Wait for 1000 millisecond(s)
```

Serial Monitor

```
Distance in cm: 329
Distance in cm: 329
Distance in cm: 329
Distance in cm: 329
Distance in cm: 329
Distance in cm: 329
Distance in cm: 329
Distance in cm: 329
```