

# Engineering Design Assignment 4

Name : Ojas

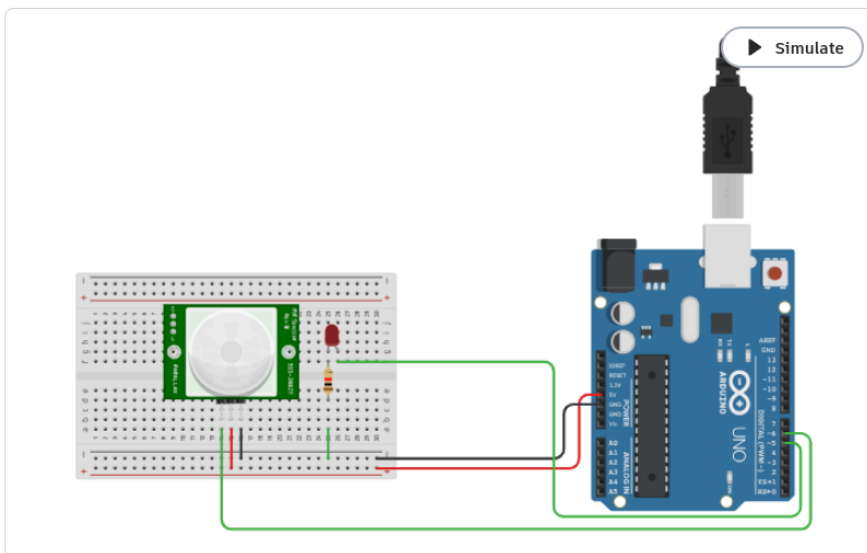
Group : 2CO3

Roll No. : 102203108

2. Using Tinkercad, design the following sensor based micro-projects to:

- Detect the motion of an object, and
- Measure distance between an object and the sensor itself.

## Assignment 4 Ques-2a)



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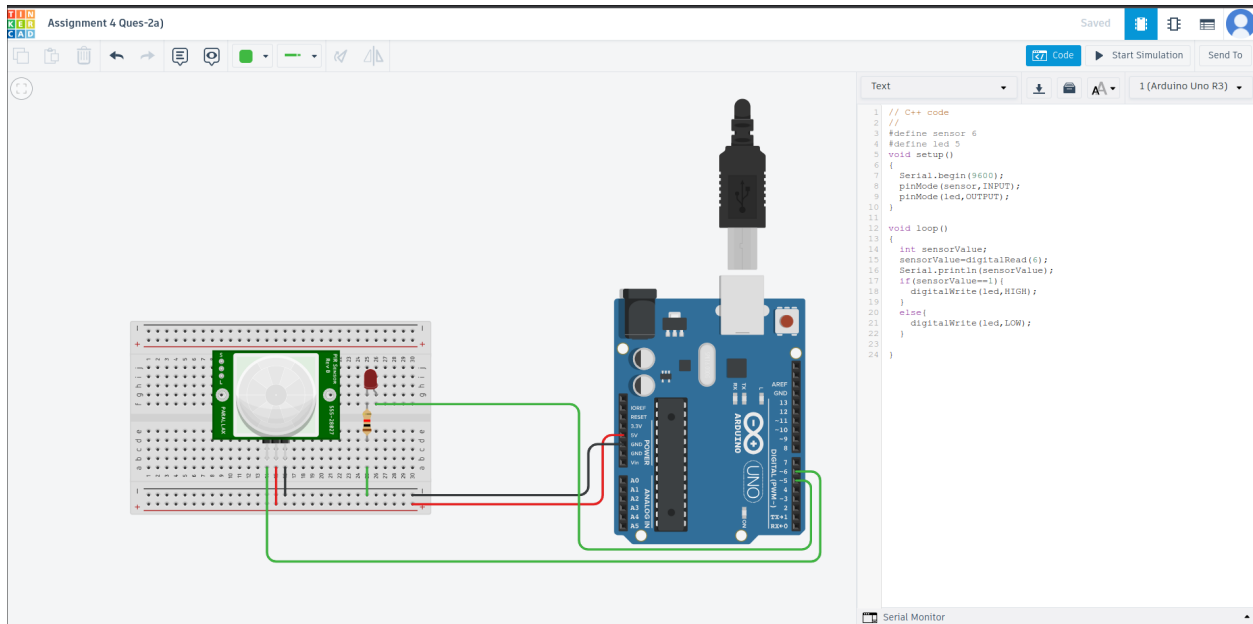
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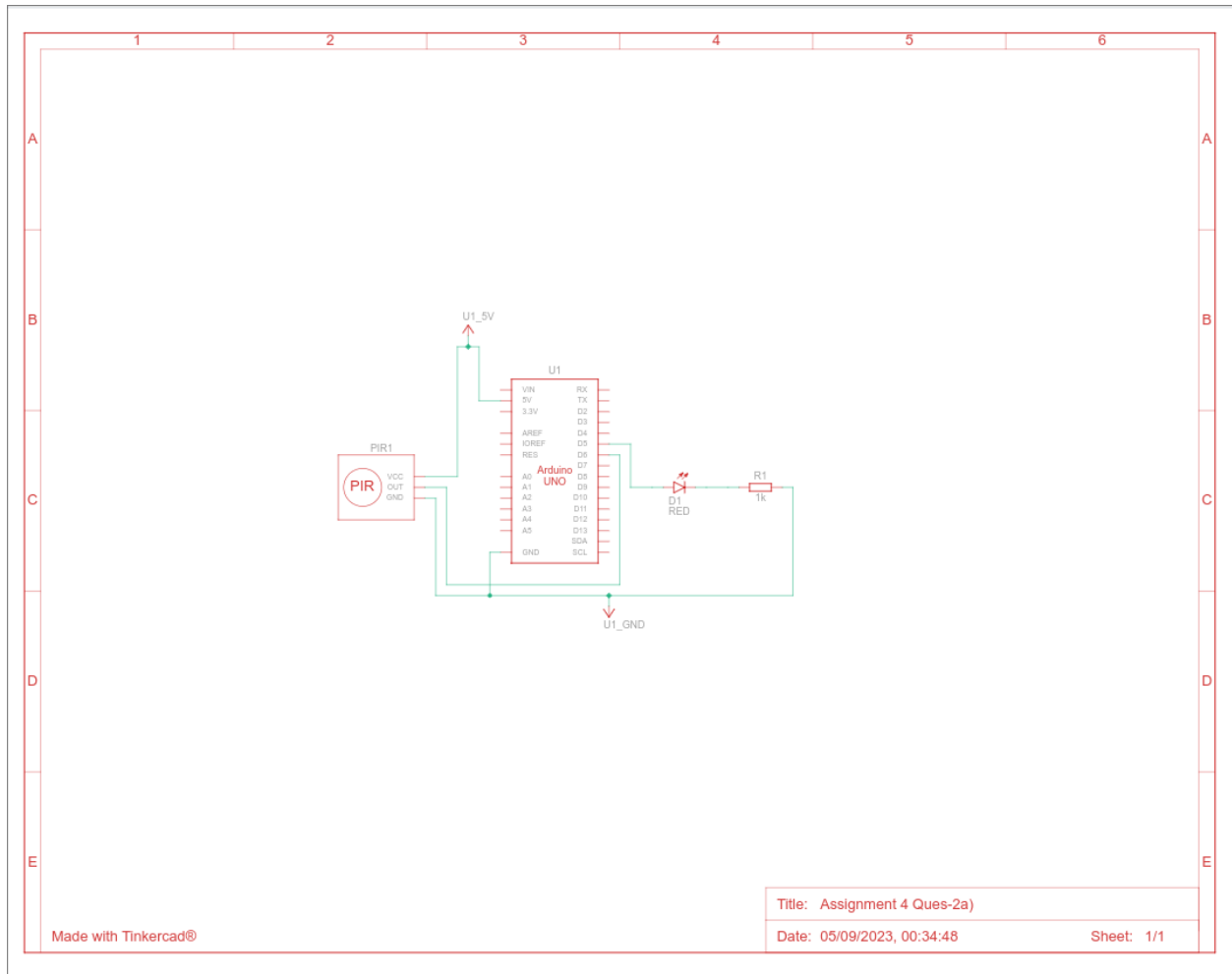


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```
// C++ code
//
#define sensor 6
#define led 5
void setup()
{
  Serial.begin(9600);
  pinMode(sensor, INPUT);
  pinMode(led, OUTPUT);
}

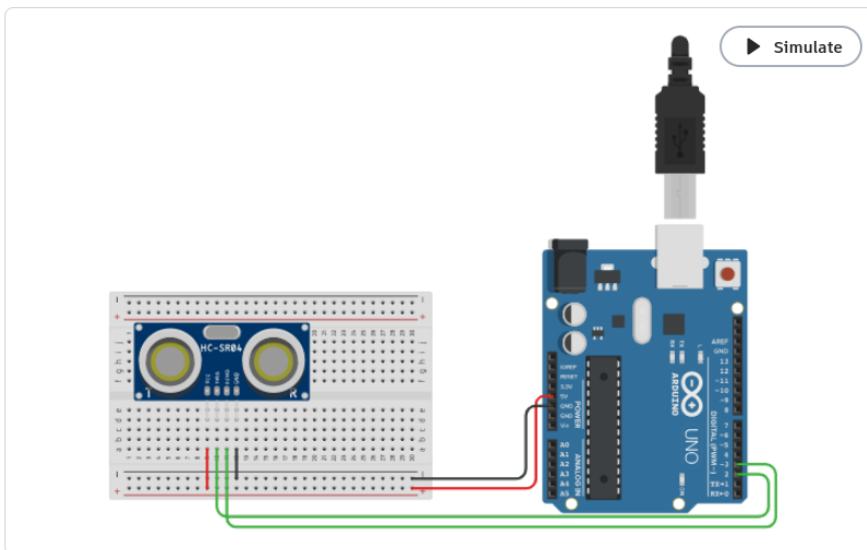
void loop()
{
  int sensorValue;
  sensorValue=digitalRead(6);
  Serial.println(sensorValue);
  if(sensorValue==1){
    digitalWrite(led,HIGH);
  }
  else{
    digitalWrite(led,LOW);
  }
}
```



Name	Quantity	Component
U1	1	Arduino Uno R3
PIR1	1	151.03702642219264 , -203.6061977028238 , -203.6061977028238 PIR Sensor
R1	1	1 kΩ Resistor
D1	1	Red LED

## Assignment 4 Ques-2b)


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
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Assignment 4 Ques-2b)

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 Code  Start Simulation  Send To

Text   1 (Arduino Uno R3)

```
1 #define trigPin 2
2 #define echoPin 3
3
4 void setup()
5 {
6   Serial.begin(9600);
7   pinMode(trigPin, OUTPUT);
8   pinMode(echoPin, INPUT);
9 }
10
11 long Time(int TrigPin,int EchoPin){
12   digitalWrite(TrigPin,HIGH);
13   delayMicroseconds(10);
14   digitalWrite(TrigPin,LOW);
15   return pulseIn(EchoPin,HIGH);
16 }
17
18 void loop()
19 {
20   int distanceCm;
21   distanceCm=0.01723*Time(trigPin,echoPin);
22   //Speed of sound in Air=343m/s
23   //Now we divide time by 2 to get the req. Time
24   //distanceInCm=0.0343/2(in cm/microsec)*Time
25   Serial.println(distanceCm);
26 }
```

 Serial Monitor

```
#define trigPin 2
#define echoPin 3

void setup()
{
```

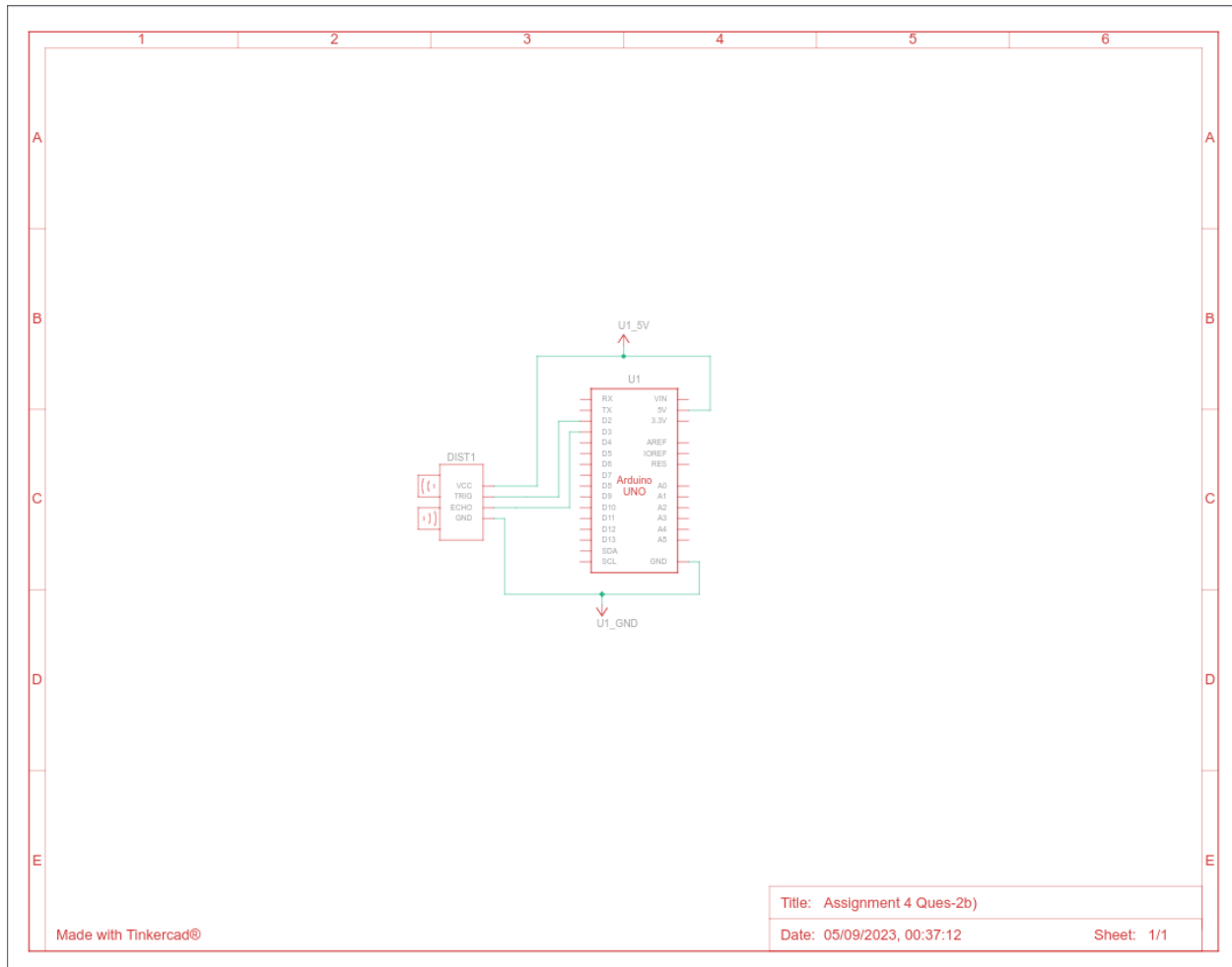
```

Serial.begin(9600);
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
}

long Time(int TrigPin,int EchoPin){
    digitalWrite(TrigPin,HIGH);
    delayMicroseconds(10);
    digitalWrite(TrigPin,LOW);
    return pulseIn(EchoPin,HIGH);
}

void loop()
{
    int distanceCm;
    distanceCm=0.01723*Time(trigPin,echoPin);
    //Speed of sound(in Air)=343m/s
    //Now we divide time by 2 to get the req. Time
    //distanceInCm=0.0343/2(in cm/microsec)*Time
    Serial.println(distanceCm);
}

```



Name	Quantity	Component
U1	1	Arduino Uno R3
DIST1	1	Ultrasonic Distance Sensor

1. Obtain the required signal for Arduino shown in figure 2 using at least two different logic gates (explain using waveforms).