Task: 2 **DETECTING LIGHT USING AMBIENT**
04.03.2022 **LIGHT SENSOR**

Problem definition:

An ambient light sensor is a component in smartphones, notebooks, other mobile devices, automotive displays and LCD TVs. It is a photodetector that is used to sense the amount of ambient light present, and appropriately dim the device's screen to match it.

Tools used:

Software - Arduino

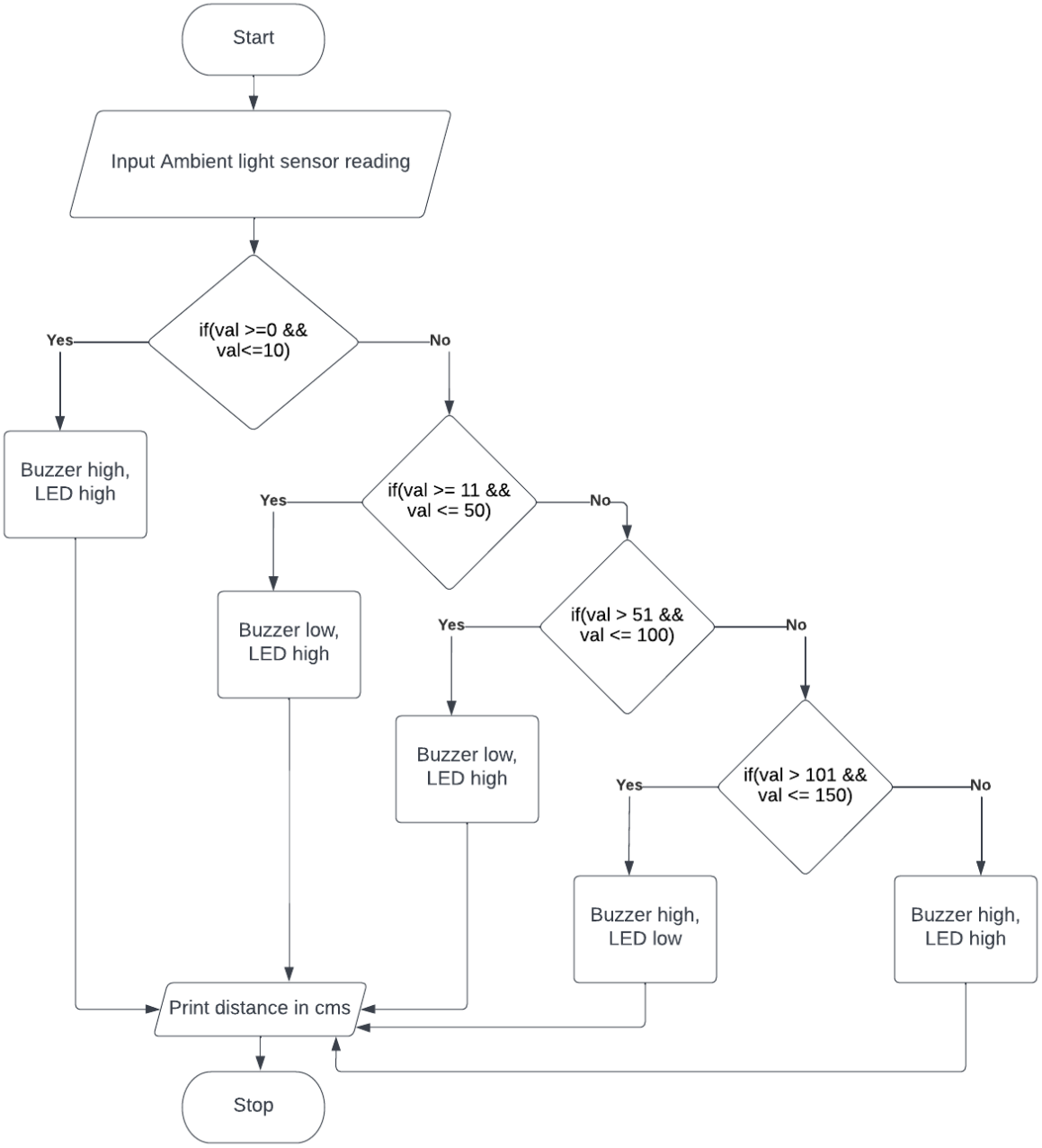
Hardware –Buzzer and Ambient light sensor

Board - Arduino UNO

Sensor description:

TEMT6000 ambient light sensor is just another analog sensor.It is compatible with micro-controllers which supports analog data input. This sensor is working like a transistor. As light falling on sensor increases the analog output(SIGNAL) will increase.

Flowchart:


Start
Input Ambient light sensor reading
if(val >=0 && val<=10)
Yes
No
Buzzer high, LED high
if(val >= 11 && val <= 50)
Yes
No
Buzzer low, LED high
if(val > 51 && val <= 100)
Yes
No
Buzzer low, LED high
if(val > 101 && val <= 150)
Yes
No
Buzzer high, LED low
Buzzer high, LED high
Print distance in cms
Stop

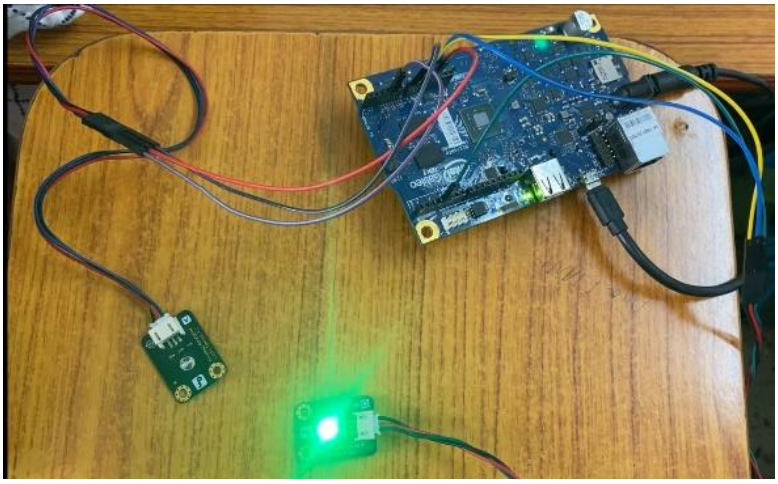
Source Code:

```
const int buzzer = 8;
const int LED= 7;
void setup()
{
 pinMode(buzzer, OUTPUT);
  pinMode(LED, OUTPUT);
  Serial.begin(9600); // open serial port, set the baud rate to 9600 bps
}
void loop()
{
     int val;
      val=analogRead(0);
      delay(100);
      Serial.print("Distance: ");
      Serial.println(val);
      digitalWrite(buzzer, LOW);
      digitalWrite(LED, LOW);


   if(val >=0 && val<=10)
  {
   Serial.print("Distance: ");
```

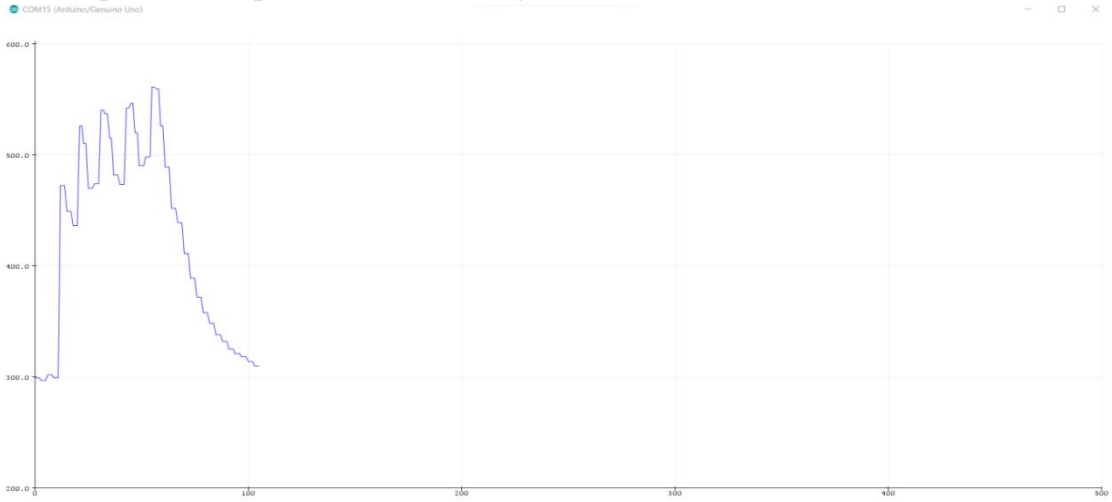
```
 Serial.println(val);
 digitalWrite(buzzer, HIGH);
 digitalWrite(LED, HIGH);



}
else if(val >= 11 && val <= 50)
{
  Serial.print("Distance: ");
  Serial.println(val);
  Serial.println(" cm");
  digitalWrite(buzzer, LOW);
  digitalWrite(LED, HIGH);

  delay(100);
}

 else if(val > 51 && val <= 100)
{

  Serial.print("Distance: ");
  Serial.println(val);
  digitalWrite(buzzer, LOW);
  digitalWrite(LED, HIGH);

  delay(100);
}
```

```
  else if(val > 101 && val <= 150)
  {
     Serial.print("Distance: ");
   Serial.println(val);
    digitalWrite(buzzer, HIGH);
    digitalWrite(LED, LOW);
     tone(buzzer,261);
    delay(100);
  }
  else
  {
    Serial.print("Distance: ");
    Serial.println(val);
    digitalWrite(buzzer, HIGH);
    digitalWrite(LED,HIGH);


  }
}
```

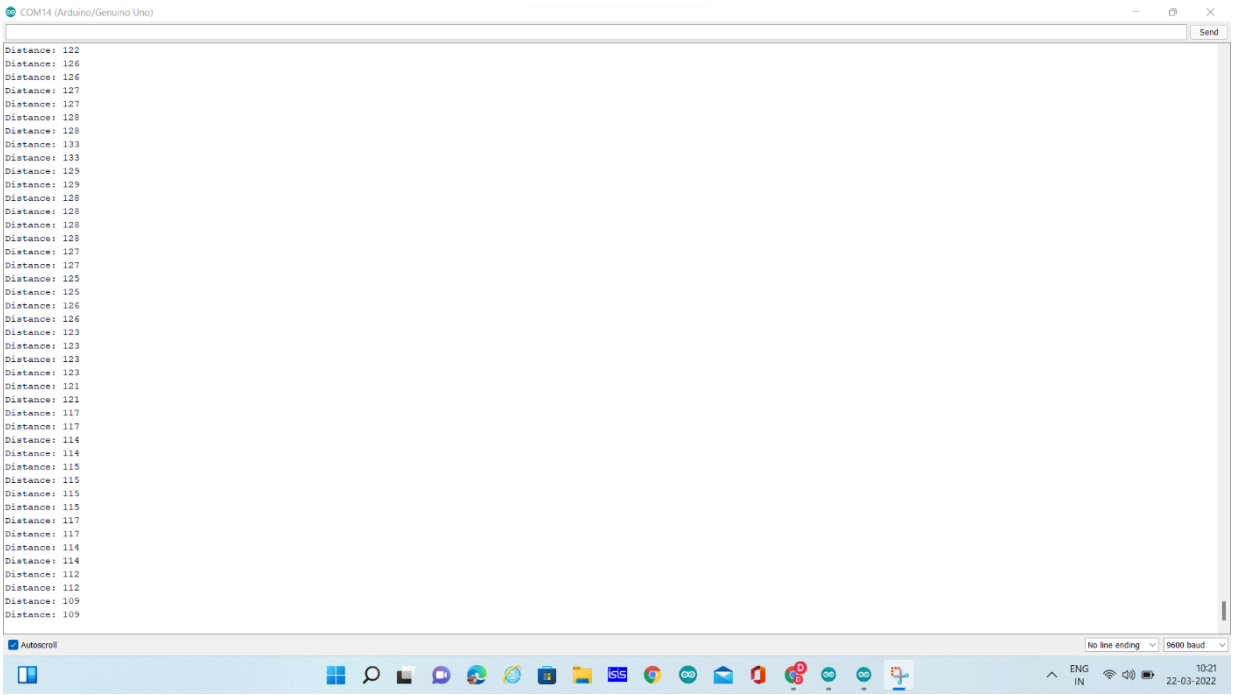
Sample input and output:



Serial plotter output of Ambient light sensor:



Serial monitor output of Ambient light sensor:



Real time application:

1. Most portable personal electronics now have ambient light sensors used to adjust brightness. If the device can sense that it is in a dark place, it turns down the screen brightness to save power and not surprise the user with a very bright screen.
2. An ambient light sensor is a component in smart phones, notebooks, other mobile devices, automotive displays and LCD TVs.

Conclusion:

Hence, the distance will be calculated using Arduino and based on the distance value the buzzer sound and LED gets high or low.