Group Project:-

Distance Measurement Using laser and ultrasonic sensors

- *Team Members*

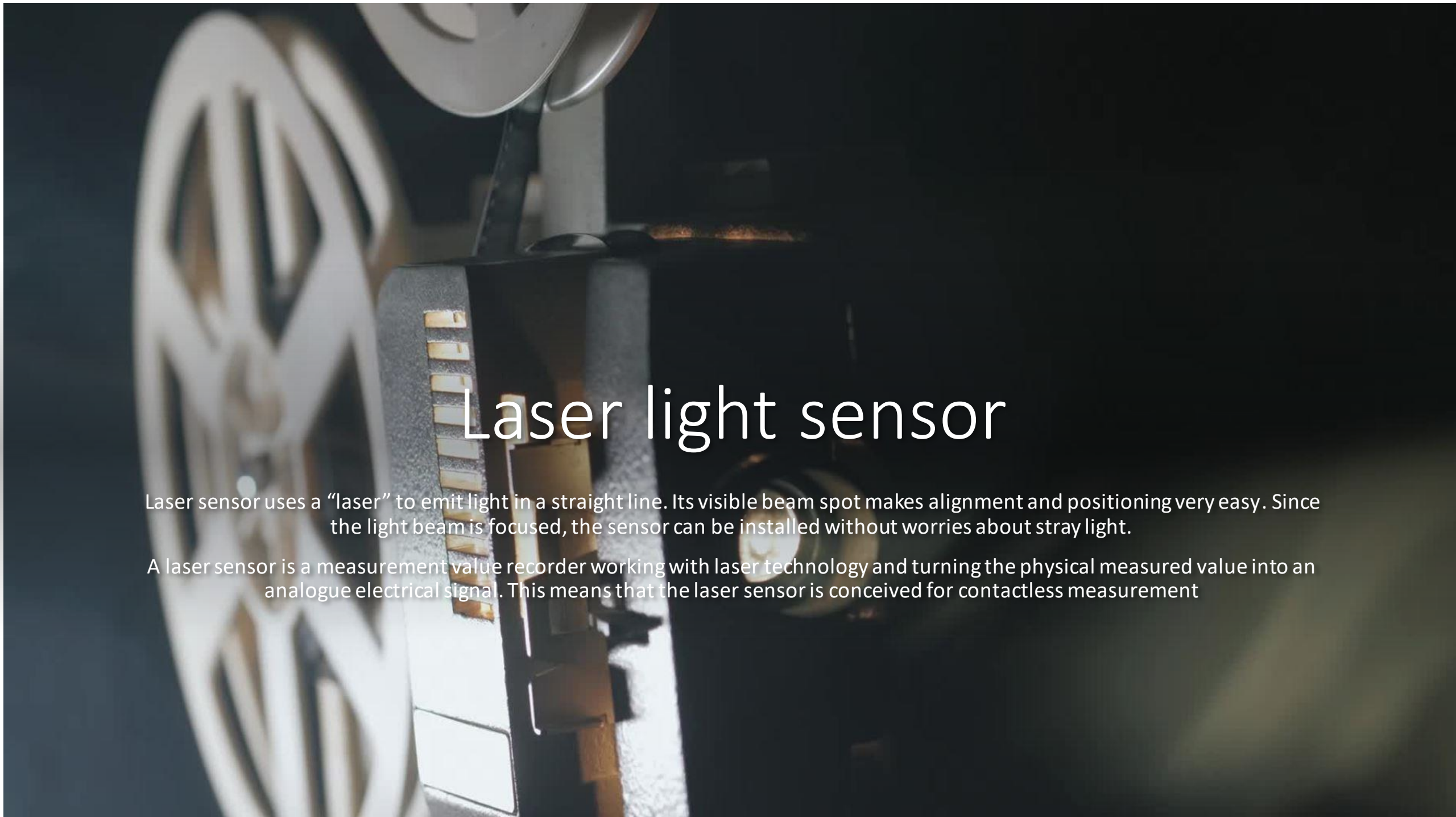
1)Sujitha

2)Rohan

3)Shristi

4)Mohitha

5)Avinash



Laser light sensor

Laser sensor uses a “laser” to emit light in a straight line. Its visible beam spot makes alignment and positioning very easy. Since the light beam is focused, the sensor can be installed without worries about stray light.

A laser sensor is a measurement value recorder working with laser technology and turning the physical measured value into an analogue electrical signal. This means that the laser sensor is conceived for contactless measurement

Ultrasonic sensor

An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves. An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay back information about an object's proximity.

Ultrasonic sensors are used primarily as proximity sensors. They can be found in automobile self-parking technology and anti-collision safety systems. Ultrasonic sensors are also used in robotic obstacle detection systems, as well as manufacturing technology.

Advantages and disadvantages of ultrasonic sensor

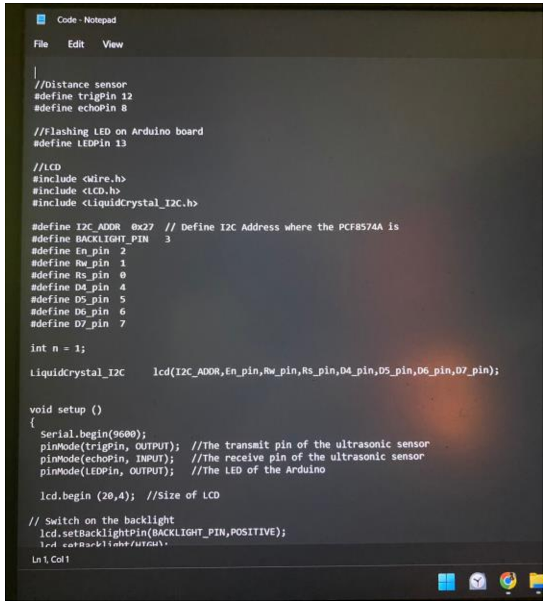
Advantages of Ultrasonic Sensors:

Not affected by color or transparency of objects.
Can be used in dark environments.
Low-cost option.
Not highly affected by dust, dirt, or high-moisture environments.
Cannot work in a vacuum.
Not designed for underwater use.
Sensing accuracy affected by soft materials.

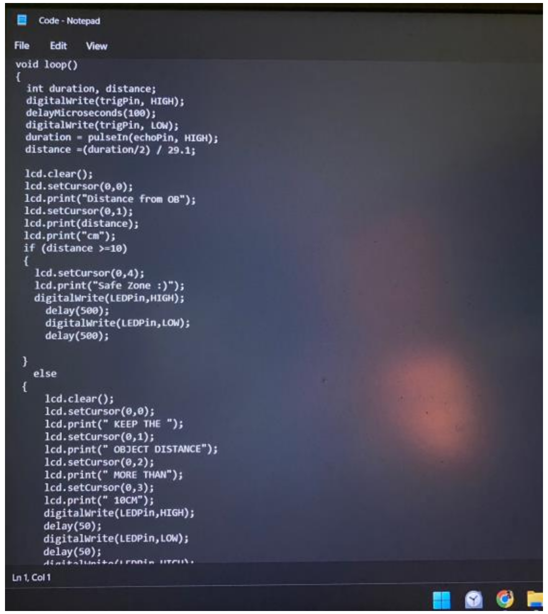
Disadvantages of Ultrasonic sensor:

It is very sensitive to variation in the temperature.
It has more difficulties in reading reflections from soft, curved and thin as well as a small object.
These sensors have a base detecting distance.
It required careful attention for an experienced technician.

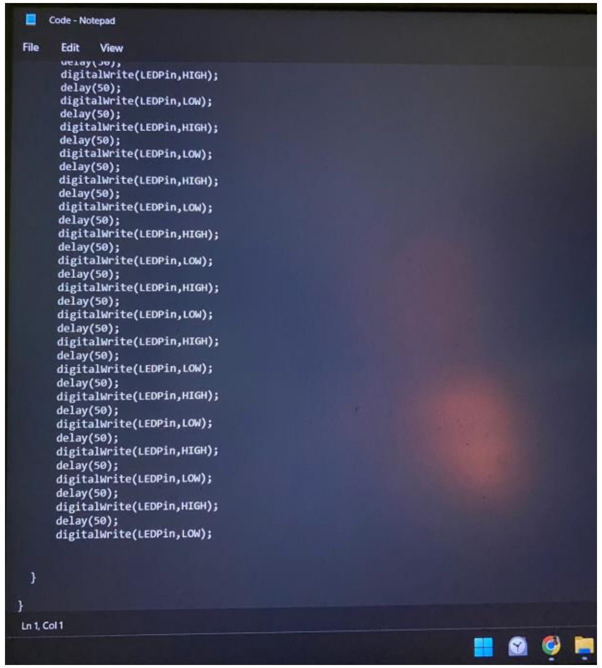
Functioning of hardware:



```
Code - Notepad
File    Edit    View

//Distance sensor
#define trigPin 12
#define echoPin 8

//Flashing LED on Arduino board
#define LEDPin 13

//LCD
#include <Wire.h>
#include <LCD.h>
#include <LiquidCrystal_I2C.h>

#define I2C_ADDR  0x27  // Define I2C Address where the PCF8574A is
#define BACKLIGHT_PIN   3
#define En_pin  2
#define Rw_pin  1
#define Rs_pin  0
#define D4_pin  4
#define D5_pin  5
#define D6_pin  6
#define D7_pin  7

int n = 1;

LiquidCrystal_I2C     lcd(I2C_ADDR,En_pin,Rw_pin,Rs_pin,D4_pin,D5_pin,D6_pin,D7_pin);


void setup ()
{
  Serial.begin(9600);
  pinMode(trigPin, OUTPUT);  //The transmit pin of the ultrasonic sensor
  pinMode(echoPin, INPUT);   //The receive pin of the ultrasonic sensor
  pinMode(LEDPin, OUTPUT);   //The LED of the Arduino

  lcd.begin (20,4);  //Size of LCD

// Switch on the backlight
  lcd.setBacklightPin(BACKLIGHT_PIN,POSITIVE);
Ln 1, Col 1
```



```
Code - Notepad
File    Edit    View
void loop()
{
  int duration, distance;
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(100);
  digitalWrite(trigPin, LOW);
  duration = pulseIn(echoPin, HIGH);
  distance =(duration/2) / 29.1;

  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("Distance from OB");
  lcd.setCursor(0,1);
  lcd.print(distance);
  lcd.print("cm");
  if (distance >=10)
  {
    lcd.setCursor(0,4);
    lcd.print("Safe Zone :)");
    digitalWrite(LEDPin,HIGH);
      delay(500);
      digitalWrite(LEDPin,LOW);
      delay(500);

  }
    else
  {
      lcd.clear();
      lcd.setCursor(0,0);
      lcd.print(" KEEP THE ");
      lcd.setCursor(0,1);
      lcd.print(" OBJECT DISTANCE");
      lcd.setCursor(0,2);
      lcd.print(" MORE THAN");
      lcd.setCursor(0,3);
      lcd.print(" 10CM");
      digitalWrite(LEDPin,HIGH);
      delay(50);
      digitalWrite(LEDPin,LOW);
      delay(50);
Ln 1, Col 1
```



```
Code - Notepad
File    Edit    View
      digitalWrite(LEDPin,HIGH);
      delay(50);
      digitalWrite(LEDPin,LOW);
      delay(50);
      digitalWrite(LEDPin,HIGH);
      delay(50);
      digitalWrite(LEDPin,LOW);
      delay(50);
      digitalWrite(LEDPin,HIGH);
      delay(50);
      digitalWrite(LEDPin,LOW);
      delay(50);
      digitalWrite(LEDPin,HIGH);
      delay(50);
      digitalWrite(LEDPin,LOW);
      delay(50);
      digitalWrite(LEDPin,HIGH);
      delay(50);
      digitalWrite(LEDPin,LOW);
      delay(50);
      digitalWrite(LEDPin,HIGH);
      delay(50);
      digitalWrite(LEDPin,LOW);
      delay(50);
      digitalWrite(LEDPin,HIGH);
      delay(50);
      digitalWrite(LEDPin,LOW);
      delay(50);
      digitalWrite(LEDPin,HIGH);
      delay(50);
      digitalWrite(LEDPin,LOW);
      delay(50);
      digitalWrite(LEDPin,HIGH);
      delay(50);
      digitalWrite(LEDPin,LOW);


  }

}
Ln 1, Col 1
```

LINK-Code