DYNAMIC SOLAR-PANEL POSITIONING SYSTEM

PROBLEM STATEMENT :

Develop a microcontroller-based solar panel positioning system that offers maximum energy capture from sun light

SCOPE OF THE SOLUTION :

The solution involves developing a microcontroller-based single-axis solar tracking system that enhances solar energy capture by adjusting the panel's position to align with the sun's movement. This system uses sensors to detect sunlight intensity and a motorized mechanism to tilt the panel accordingly. By optimizing the panel's orientation throughout the day, it increases energy efficiency and output compared to fixed installations. The design is cost-effective, scalable for small to medium setups, and promotes sustainable energy use, making it ideal for residential and small-scale commercial applications.

REQUIRED COMPONENTS :

- TinkerCad
- Fritzing
- Arduino IDE
- Arduino UNO
- Servo motor
- LDR

CODE :

```
// Techatronic.com
#include<Servo.h>        //includingthelibraryofservomotor
Servo sg90;
int initial_position = 90;

intLDR1=A0;        //connectTheLDR1onPinA0
intLDR2=A1;  int     //ConnectTheLDR2onpinA1
error    =    5;
intservopin=9;        //Youcanchangeservojustmakesureitsonarduino'sPWMpin
void setup() {
```

```
  sg90.attach(servopin);        pinMode(LDR1,        INPUT);
  pinMode(LDR2,    INPUT);    sg90.write(initial_position);
  //Moveservoat90degree delay(2000);


}

void loop()
{
  int R1 = analogRead(LDR1); // read LDR 1 int
  R2 = analogRead(LDR2); // read LDR 2 int
  diff1= abs(R1 - R2); int diff2= abs(R2 - R1);


  if((diff1 <= error) || (diff2 <= error)) {

  } else {
    if(R1 > R2)
    {
      initial_position = --initial_position;
    }
    if(R1 < R2)
    {
      initial_position = ++initial_position;
    }
  }
  sg90.write(initial_position);
  delay(100);
}
```
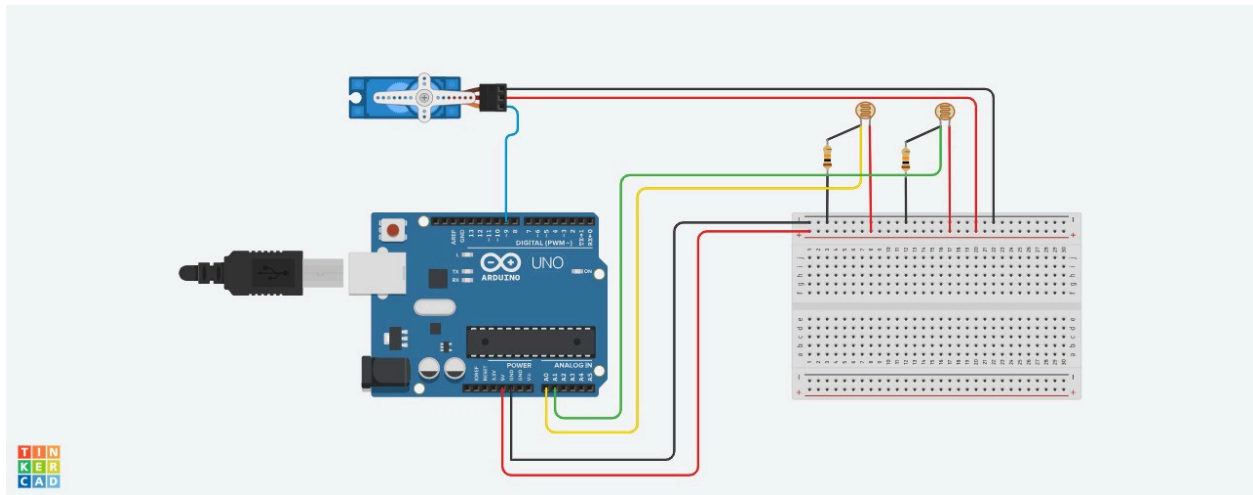
SIMULATED CIRCUIT :

PCB: