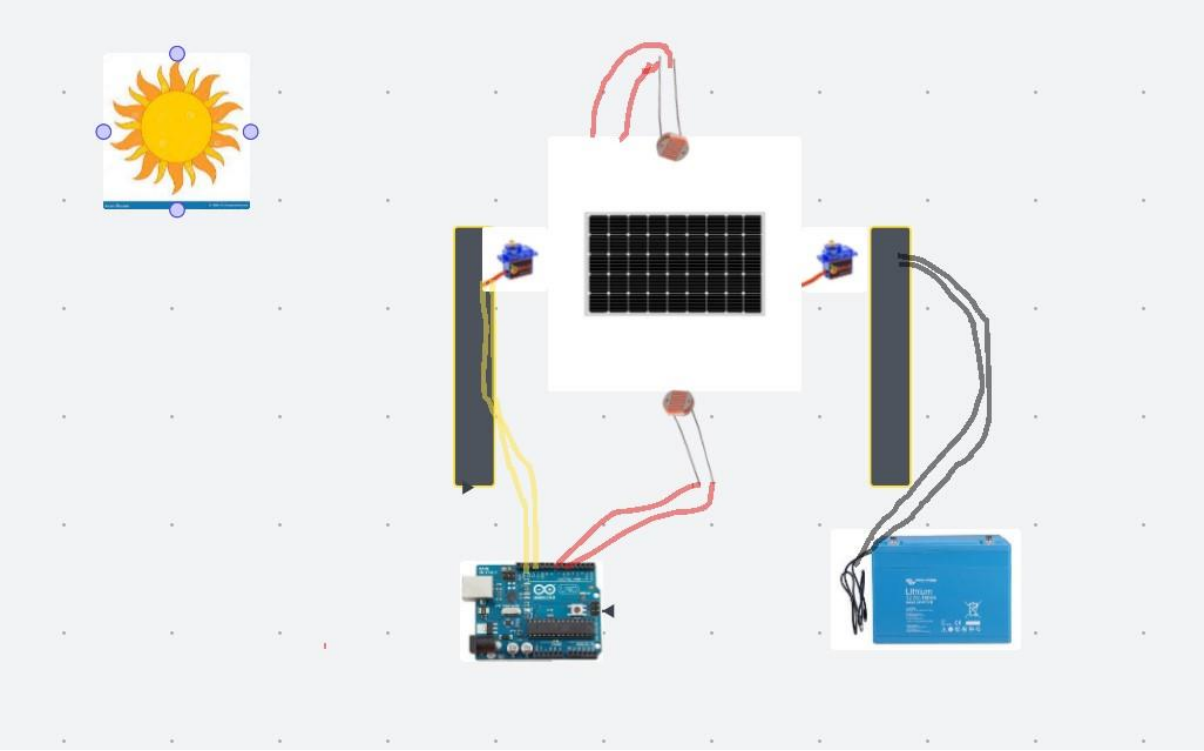
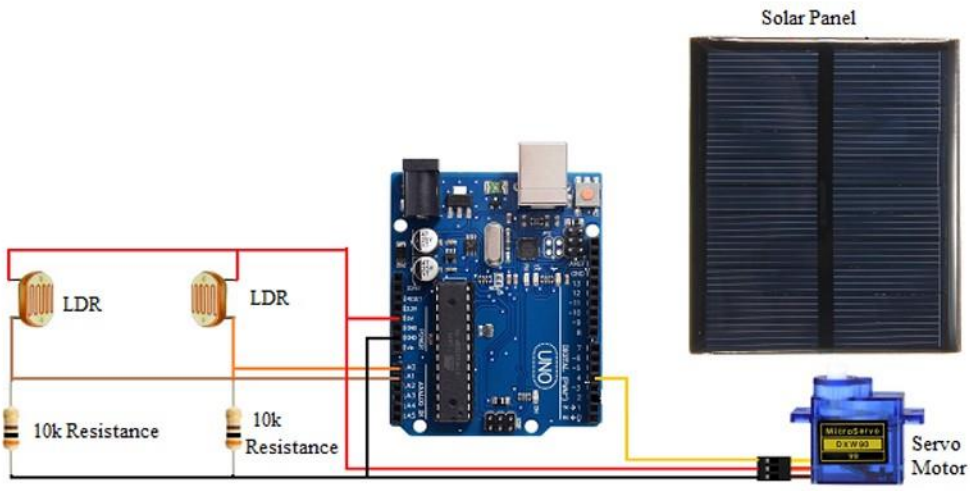
Project solar tracker



Schema:



Overview: SolarTracker is an innovative solar panel tracking system designed to optimize solar energy harvesting by utilizing servo motors and Light Dependent Resistors (LDR) sensors. The project aims to enhance the efficiency of solar panels by dynamically orienting them towards the sun throughout the day, maximizing the absorption of sunlight and significantly improving energy output.

Working Procedure of each component:

1. **Solar Panel Tracking:** SolarTracker employs servo motors to dynamically adjust the orientation of solar panels, ensuring they are always facing the sun. This automated tracking system follows the sun's movement across the sky, optimizing the incident angle for maximum energy absorption.
2. **LDR Sensor Integration:** The Light Dependent Resistors (LDR) sensors act as the eyes of SolarTracker, detecting the intensity of sunlight. Based on

the LDR sensor readings, the system calculates the sun's position and commands the servo motors to adjust the solar panels accordingly.

3. Arduino

Function: Process data from sensors and control the movement of the solar tracker.

- The microcontroller receives input from light sensors.
- It calculates the optimal azimuth and elevation angles based on the sun's position using a control algorithm.
- Commands are sent to motors or actuators to adjust the orientation of solar panels.

4. Servo Motor

Servo motor is use to adjust the solar panel towards the sun.

It is control by the Arduino to and get the data how much degrees it should move.

5. **Battery**
   To store the power generated from solar panel.

Benefits:

- **Increased Energy Output:** SolarTracker360 enhances the energy output of solar panels by optimizing their orientation towards the sun.
- **Improved Efficiency:** Dynamic solar tracking ensures that solar panels operate at peak efficiency throughout the day, adapting to changing light conditions.
- **Environmentally Friendly:** By maximizing energy production, SolarTracker contributes to a more sustainable and eco-friendly approach to solar energy utilization.
- **Reduced Dependency on Fixed Installations:** Unlike fixed solar panels, SolarTracker adjusts to the sun's position, eliminating the need for manual readjustments and maximizing energy capture.

Applications: SolarTracker is ideal for residential, commercial, and industrial solar installations where maximizing energy production is crucial. It is suitable for both on-grid and off-grid solar systems.

Future Enhancements: Future iterations may include additional sensor technologies, integration with cloud-based data analytics for predictive tracking, and compatibility with emerging solar panel technologies.

SolarTracker360 represents a leap forward in solar energy technology, providing an intelligent and efficient solution for harnessing the power of the sun to its fullest potential.

Code: