This project demonstrates how to control a servo motor using an Arduino. A servo motor can be precisely positioned at different angles, making it ideal for applications such as robotics, automation, and mechanical systems. The Arduino controls the servo motor's angle by sending a PWM signal to the motor's control wire.

Circuit Setup:

1. Servo Motor Connections:
    - VCC (Power) of the servo motor is connected to the 5V pin on the Arduino (if using a low-power servo).
    - GND (Ground) of the servo motor is connected to the GND pin on the Arduino.
    - Signal Pin of the servo motor is connected to a PWM-capable pin on the Arduino (e.g., Pin 7).
2. Power Considerations:
    - If the servo requires more current than the Arduino can supply (typically for larger servos), use an external power supply to power the servo and connect the ground of the power supply to the Arduino ground (GND).

Working Method:

1. Servo Control with PWM:

- The servo motor's position is controlled using Pulse Width Modulation (PWM). The `Servo.write(angle)` command tells the servo to move to a specific angle (0 to 180 degrees).

- The servo uses a PWM signal, where the pulse width determines the angle. For example, a pulse width of 1 millisecond corresponds to 0 degrees, and a pulse width of 2 milliseconds corresponds to 180 degrees.

2. Motor Movement:

    - The servo motor moves smoothly between the specified angles. The `for` loop in the code continuously updates the servo's position, creating a sweeping motion from 0 to 180 degrees and back.

3. Power Supply:

    - For low-power servos, the Arduino's 5V pin can power the motor directly. However, for larger servos that draw more current, you should use an external power source to avoid overloading the Arduino's voltage regulator.