**AUTOMATIC STAND  
  
Project Overview**

The aim is to create an automatic stand system for a scooter that detects when the scooter is lifted upright, triggering a servo motor to automatically retract the stand. A conducting plate is used to confirm when the stand is fully retracted, preventing unnecessary motor operation.

**Items Required:**

1. **Arduino Uno** - 1
2. **MPU6050 Sensor** - 1
3. **Servo Motor (e.g., SG90)** - 1
4. **Conducting Plate (or metallic contact plate)** - 1
5. **Resistor (10kΩ)** - 1 (for the conducting plate input)

**Pin Connections:**

1. **MPU6050 Sensor:**
   * VCC to Arduino 5V
   * GND to Arduino GND
   * SCL to Arduino A5
   * SDA to Arduino A4
2. **Servo Motor:**
   * Signal pin to Arduino pin 9
   * VCC to Arduino 5V
   * GND to Arduino GND
3. **Conducting Plate (Switch):**
   * One side of the plate to Arduino pin 2
   * The other side to GND
   * A 10kΩ pull-up resistor between Arduino pin 2 and 5V

**How It Works:**

* **Initialization**: The MPU6050 sensor is initialized and its X, Y, and Z-axis values are read. These values are used to determine the tilt of the scooter when it is on the stand.
* **Tilt Detection**: The sensor continuously monitors the tilt of the scooter. If the tilt changes significantly, indicating that the scooter has been lifted (e.g., the X-axis or Z-axis becomes nearly level), the system assumes the scooter has been straightened.
* **Stand Retraction**: Upon detecting the scooter has been lifted, the Arduino signals the servo motor to rotate 45 degrees, retracting the stand.
* **Stand Position Verification**: A conducting plate is positioned where the stand rests when fully retracted. When the stand touches this plate, it closes the circuit (acting as a switch), sending a signal to the Arduino to stop the servo motor.

**Code Explanation:**

* **Tilt Detection**: The code reads the MPU6050 sensor's X, Y, and Z-axis values to determine the tilt of the scooter. The initial readings are stored as reference values.
* **Servo Motor Control**: The servo motor is controlled to retract the stand by 45 degrees when the tilt values indicate that the scooter is lifted upright.
* **Stand Position Verification**: The conducting plate acts as a switch to detect if the stand is fully retracted. When the stand touches the plate, the circuit closes, and the Arduino stops further servo movement.