

## THINGS REQUIRED

### 1. Electronics:

- Microcontroller (e.g., Arduino)
- DC motors with wheels
- Motor driver (L298N or similar)
- Ultrasonic sensors (for obstacle detection)
- Battery (rechargeable, e.g., Li-ion)
- Switches and jumper wires
- IR sensors (optional for line following)

### 2. Mechanical Components:

- Chassis (robot body, can be custom or pre-built)
- Castor wheel (for support)
- Screws, nuts, and bolts
- Small broom/brush attachments
- Dust collection tray or compartment

### 3. Tools:

- Screwdrivers
- Soldering iron and solder wire
- Hot glue gun
- Wire cutters and strippers
- Multimeter (for testing connections)

## PROCEDURE

### Step 1: Assemble the Chassis

- Attach the motors to the chassis using screws and bolts.
- Add the wheels to the motors and fix the castor wheel at the front or back for balance.

### Step 2: Install Sensors

- Mount ultrasonic sensors at the front for obstacle detection.
- Position IR sensors on the bottom (if line-following is required).

### Step 3: **Connect the Electronics**

- Wire the motors to the motor driver.
- Connect the motor driver to the microcontroller.
- Attach sensors to the respective pins on the microcontroller.
- Wire the battery and add a switch for power control.

### Step 4: **Programming the Microcontroller**

- Write a program to control the motors based on sensor input.
- Include logic for obstacle avoidance and cleaning path optimization.
- Upload the program to the microcontroller using a USB cable.

### Step 5: **Attach Cleaning Mechanism**

- Secure small brooms or brushes to the chassis.
- Ensure they are positioned to sweep dirt into the dust tray.

### Step 6: **Power Up and Test**

- Turn on the robot and observe its movements.
- Adjust the code or sensor positions if necessary to improve performance.

### Step 7: **Final Adjustments**

- Add a cover or housing to protect the electronics.
- Test on different surfaces to ensure proper cleaning.

## **DETAILED CONNECTION SETUP FOR CLEANSWEEP - FLOOR CLEANING ROBOT**

### **1. Motor Connection:**

- **Components Needed:**
  - DC motors (2 or more)
  - Motor driver (L298N or similar)

- **Wiring:**
  - Connect the motor terminals to the output pins of the motor driver (OUT1, OUT2 for Motor 1 and OUT3, OUT4 for Motor 2).
  - Connect the motor driver's power input (12V and GND) to the battery terminals.
  - Connect the motor driver's input pins (IN1, IN2, IN3, IN4) to the digital pins of the microcontroller.

## **2. Ultrasonic Sensor Connection:**

- **Components Needed:**
  - Ultrasonic sensor (HC-SR04 or similar)
- **Wiring:**
  - Connect the VCC pin of the sensor to the 5V pin of the microcontroller.
  - Connect the GND pin to the ground (GND) of the microcontroller.
  - Connect the TRIG pin to a digital pin (e.g., D8) on the microcontroller.
  - Connect the ECHO pin to another digital pin (e.g., D9).

## **3. IR Sensor Connection (Optional):**

- **Components Needed:**
  - IR sensors (for line following)
- **Wiring:**
  - Connect the VCC pin of the IR sensor to the 5V pin of the microcontroller.
  - Connect the GND pin to the GND of the microcontroller.
  - Connect the OUT pin to a digital pin on the microcontroller (e.g., D2).

## **4. Power Supply:**

- **Components Needed:**
  - Battery (Li-ion or similar)
  - On/Off switch
- **Wiring:**
  - Connect the battery's positive terminal to the VCC of the motor driver.
  - Connect the battery's ground to the motor driver's GND.
  - Add a switch between the battery and the motor driver to control power.

## **5. Microcontroller Connection:**

- **Components Needed:**
  - Arduino (or another microcontroller)
- **Wiring:**
  - Connect the microcontroller to the motor driver inputs (IN1-IN4).
  - Connect sensor input pins to the appropriate digital pins.
  - Use the 5V and GND pins on the microcontroller to power sensors.