Obstacle Avoidance Robot

Components Used:

1. **Arduino** (1 unit)
2. **H-bridge** (1 unit)
3. **HC-SR04 Ultrasonic Sensor** (1 unit)
4. **DC Motors** (4 units)
5. **Batteries** (3 units)
6. **Wires and connectors**
7. **Chassis**
8. **Breadboard**

Hardware Connections:

Pin Assignments:

Component	Pin Description	Arduino Pin
Left Motor	Direction Control	Pin 4 (rev) & Pin 5 (fwd)
Right Motor	Direction Control	Pin 7 (rev) & Pin 6 (fwd)
Ultrasonic Sensor	Trig Pin	Pin 10
	Echo Pin	Pin 9

Step-by-Step Hardware Connections:

1. **Connecting the Motors:**
   - Connect the **left motor's positive terminal** to **OUT1** on the **H-bridge**
   - Connect the **left motor's negative terminal** to **OUT2** on the **H-bridge**
   - Connect the **right motor's positive terminal** to **OUT3** on the **H-bridge**
   - Connect the **right motor's negative terminal** to **OUT4** on the **H-bridge**
2. **Connecting Motor Driver to Arduino:**
   - Connect **IN1** (**H-bridge**) to **pin 4** on the Arduino (Reverse left motor).
   - Connect **IN2** (**H-bridge**) to **pin 5** on the Arduino (Forward left motor).
   - Connect **IN3** (**H-bridge**) to **pin 7** on the Arduino (Reverse right motor).
   - Connect **IN4** (**H-bridge**) to **pin 6** on the Arduino (Forward right motor).
3. **Powering the Motor Driver:**
   - Connect the **+12V pin** of the **H-bridge** to the **positive terminal of the battery pack**.
   - Connect the **GND pin** of the **H-bridge** to the **GND of the battery pack** (common ground).
   - Connect the **5V pin** from the **H-bridge** to the **5V pin** on the **Arduino** for powering the Arduino.
4. **Connecting Ultrasonic Sensor (HC-SR04) to Arduino:**

- **Trig Pin** (HC-SR04) is connected to **pin 10** on the Arduino Mega.
- **Echo Pin** (HC-SR04) is connected to **pin 9** on the Arduino Mega.
- **VCC** is connected to **5V** on the Arduino Mega.
- **GND** is connected to **GND** on the Arduino Mega.

- **Trig Pin** (HC-SR04) is connected to **pin 10** on the Arduino Mega.
- **Echo Pin** (HC-SR04) is connected to **pin 9** on the Arduino Mega.
- **VCC** is connected to **5V** on the Arduino Mega.
- **GND** is connected to **GND** on the Arduino Mega.