**🔧 Stepper Motor and Power Supply Notes**

**1. Stepper Motor Must Use External Power**

If the stepper motor is powered directly from the Arduino's onboard **5V pin**, it may lead to:

* **Weak torque** from the stepper motor.
* **Malfunctioning of other connected devices**, such as inaccurate readings from ultrasonic sensors.

**2. Ground Must Be Shared (Common Ground)**

When using an **external power supply**, make sure to **connect the GND of the external module to the GND of the Arduino**.

All power-consuming components (e.g., ULN2003 drivers, sensors, Arduino) must share the **same ground reference**.  
Failure to do so can cause the Arduino to **freeze or no responding unexpectedly after running for a short time**.

**🔌 Pin Usage Notes**

**3. Pins D0 and D1 Should Not Be Used for I/O**

Pins **D0 (RX)** and **D1 (TX)** are used for **USB serial communication**. If used for stepper control or other I/O:

* It may cause **code upload failures**.
* It may **conflict with Serial Monitor output**.

**Avoid using D0 and D1 unless you're not using Serial functions.**

**4. Use Analog Pins as Digital I/O When Needed**

If you run out of digital pins, **analog pins A0 to A5** can also be used as **digital outputs**:

pinMode(A0, OUTPUT);

digitalWrite(A0, HIGH);

**🌀 AccelStepper Library Caution**

**5. AccelStepper Wiring Order Is Not Sequential**

When using the **AccelStepper library** in **4-wire mode (HALF4WIRE)**, note that the pin sequence is:

AccelStepper motor(AccelStepper::HALF4WIRE, IN1, IN3, IN2, IN4);

This is **not** the simple IN1–IN2–IN3–IN4 order.  
Wiring incorrectly will cause the stepper motor to shake or rotate erratically.