■ Arduino Joystick Direction Display with I2C LCD

This Arduino project reads input from a 2-axis analog joystick and displays its movement direction — UP, DOWN, LEFT, RIGHT, CENTER, or BUTTON (pressed) — on a 16x2 I2C LCD screen in real time. It's a great beginner-friendly project for learning analog input handling, digital button detection, and LCD communication over I2C.

■ Hardware Components

Component	Quantity	Description
Arduino Uno	1	Main microcontroller board
Analog Joystick Module	1	Provides X, Y, and button signals
16x2 LCD with I2C Backpack	1	Displays joystick direction
Jumper Wires	5–6	For connections
Breadboard	1	Optional, for easier wiring

■ Circuit Connections

Joystick → Arduino
GND → GND
+5V → 5V
VRx → A0
VRy → A1
SW → 2

LCD (I2C) → Arduino
GND → GND
VCC → 5V
SDA → A4
SCL → A5

■ How It Works

The joystick provides two analog outputs (X and Y) and a digital button signal. The Arduino reads these values and decides the direction based on threshold ranges, then displays the result on the LCD using I2C communication.

■ Possible Improvements

- Add automatic joystick calibration
- Apply analog smoothing for cleaner readings
- Display X/Y values on the LCD
- Combine with a servo or robot control system

■ License