**Arduino I2C LCD Display**

**Objective:**

The objective of this project is to display a personalized welcome message, on an I2C-based 16x2 LCD module using an Arduino.

**Components Required:**

**Hardware:**

* + Arduino Board (e.g., Uno, Mega, or Nano)
  + 16x2 LCD with I2C Backpack
  + Jumper Wires
  + Breadboard (optional)

**Software:**

* + Arduino IDE
  + LiquidCrystal\_I2C library

**Circuit Diagram:**

| **LCD I2C Pin** | **Arduino Pin** |
| --- | --- |
| GND | GND |
| VCC | 5V |
| SDA | [SDA or A4 (Uno)] or 20 (Mega) |
| SCL | [SCl or A5 (Uno)] or 21 (Mega) |

**Step-by-Step Instructions:**

1. **Hardware Connections:**
   * Connect the GND and VCC of the I2C module to the Arduino's GND and 5V, respectively.
   * Connect the SDA pin of the I2C module to A4 (Uno) or 20 (Mega).
   * Connect the SCL pin of the I2C module to A5 (Uno) or 21 (Mega).
2. **Install LiquidCrystal\_I2C Library:**
   * Open the Arduino IDE.
   * Go to Tools > Manage Libraries.
   * Search for LiquidCrystal\_I2C and install the latest version.
3. **Code to display the message:**

#include <Wire.h>

#include <LiquidCrystal\_I2C.h>

// Set the LCD address to 0x27 for a 16x2 LCD (common address; adjust if different)

LiquidCrystal\_I2C lcd(0x27, 16, 2);

void setup() {

// Initialize the LCD

lcd.begin();

// Turn on the backlight

lcd.backlight();

// Print the welcome message on the LCD

lcd.setCursor(0, 0); // Set cursor to column 0, row 0

lcd.print("Welcome to");

lcd.setCursor(0, 1); // Set cursor to column 0, row 1

lcd.print("Arduino Projects");

}

void loop() {

// Nothing to do here; the message remains displayed

}

1. **Upload the Code:**
   * Open the Arduino IDE.
   * Copy and paste the code above.
   * Connect your Arduino to your computer.
   * Select the correct Board and Port under Tools.
   * Click the Upload button.
2. **Verify Output:**

The LCD should display: “Welcome to Arduino Projects”

**Challenges and Solutions:**

1. **I2C Address Issue:**
   * The default address 0x27 might not match your LCD module. Use an I2C scanner code to find the correct address.
2. **Contrast Adjustment:**
   * If the LCD is blank or too dim, adjust the contrast using the potentiometer on the I2C module.
3. **No Display:**
   * Check the wiring, power supply, and ensure the correct I2C address is used.

**Code to view the default address:**

#include <Wire.h>

void setup() {

Wire.begin();

Serial.begin(9600);

while (!Serial); // Wait for Serial Monitor to connect

Serial.println("I2C Scanner Starting...");

}

void loop() {

Serial.println("Scanning...");

int devices = 0;

for (byte address = 1; address < 127; address++) {

Wire.beginTransmission(address);

byte error = Wire.endTransmission();

if (error == 0) {

Serial.print("I2C device found at address 0x");

if (address < 16) Serial.print("0");

Serial.println(address, HEX);

devices++;

}

}

if (devices == 0) {

Serial.println("No I2C devices found.");

} else {

Serial.println("Scan complete.");

}

delay(5000); // Wait 5 seconds before next scan

}