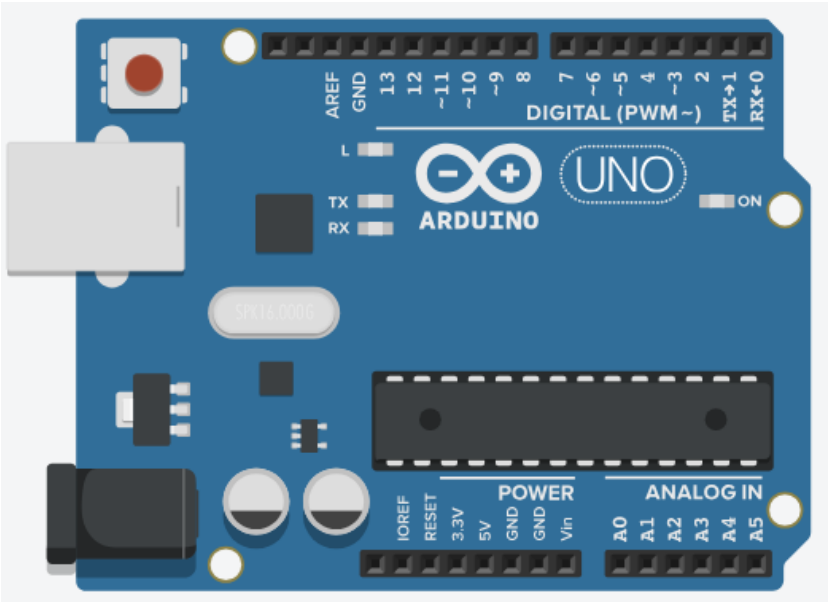
Tutorial 5: OLED Screen

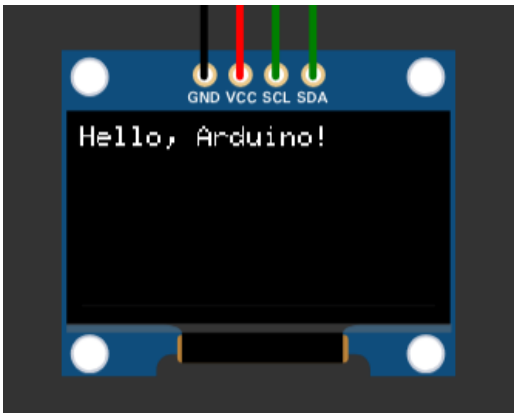
In this tutorial, we will learn how to write text and display it on an OLED (Organic Light Emitting Diode) screen using an Arduino microcontroller. OLED screens provide a compact and visually appealing way to display information in your Arduino projects. This tutorial is designed for school students who are new to Arduino and want to learn how to work with OLED screens.

Hardware Required:

Arduino board (e.g., Arduino Uno)



OLED screen (e.g., 0.96" I2C OLED display)



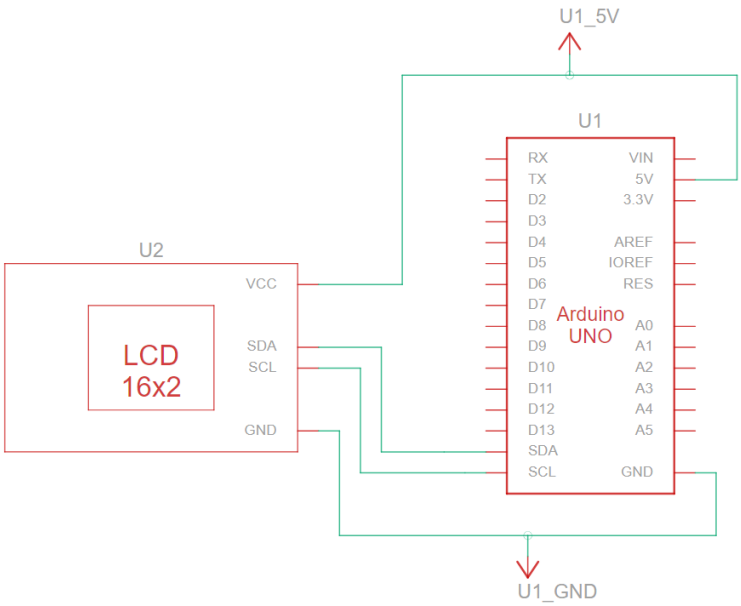
OLED’ stands for Organic Light-Emitting Diode, a technology that uses LEDs in which the light is produced by organic molecules. OLED displays feature great image quality, bright colors, fast motion and most importantly very high contrast.

Jumper wires



Step 1: Setting up the Circuit

To begin, let's set up the circuit to connect the OLED screen to the Arduino:



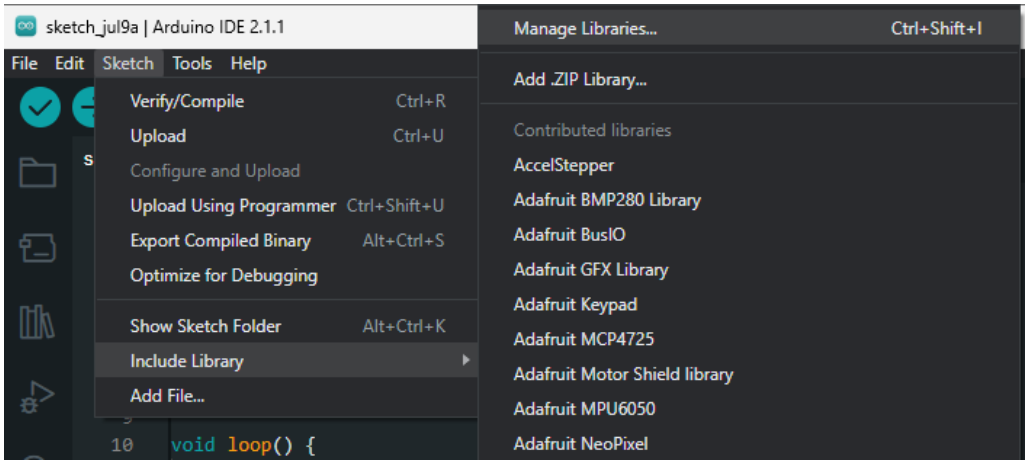
1. Connect the VCC pin of the OLED screen to the 5V pin on the Arduino.
2. Connect the GND pin of the OLED screen to the GND pin on the Arduino.
3. Connect the SDA pin of the OLED screen to the A4 or SDA pin on the Arduino.
4. Connect the SCL pin of the OLED screen to the A5 or SCL pin on the Arduino.

Step 2: Installing the Required Libraries

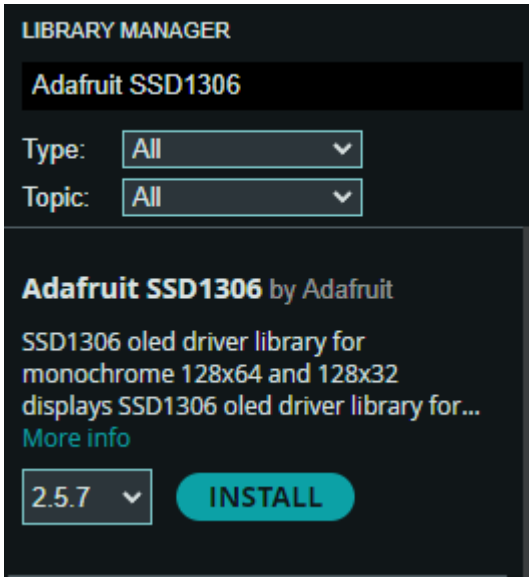
Next, we need to install the necessary libraries for working with the OLED screen:

1. Launch the Arduino IDE on your computer.

2. Go to "Sketch" -> "Include Library" -> "Manage Libraries".



3. In the Library Manager, search for "Adafruit SSD1306".



4. Click on the "Adafruit SSD1306" library and choose the latest version. Then click the "Install" button.

Step 3: Writing the Code

1. We start by including the necessary libraries: *Wire.h* for I2C communication, *Adafruit_GFX.h* for graphics functions, and *Adafruit_SSD1306.h* for the OLED screen.

```
#include <Wire.h>
#include <Adafruit_GFX.h>
#include <Adafruit_SSD1306.h>
```

2. We initialize the Adafruit_SSD1306 object named display with the screen dimensions (128x64 pixels) and the I2C pins.
3. Next, we define the constant variables **SCREEN_WIDTH** and **SCREEN_HEIGHT** to store the dimensions of the OLED screen.

```
#define SCREEN_WIDTH 128
#define SCREEN_HEIGHT 64

Adafruit_SSD1306 display(SCREEN_WIDTH, SCREEN_HEIGHT, &Wire, -1);
```

4. In the setup() function, we initialize the OLED display, clear any previous content, and set the text size and color.

```
void setup() {
  // Initialize the OLED display
  if (!display.begin(SSD1306_SWITCHCAPVCC, 0x3C)) {
    Serial.println("SSD1306 allocation failed");
    for (;;);
  }

  display.setTextColor(SSD1306_WHITE);
  display.setTextSize(1);


}
```

5. Inside the loop() function, we clear the previous display content, set the cursor position to (0, 0), and use display.println() to write the text "Hello, Arduino!" to the OLED screen.
6. We update the display using display.display().
7. Finally, we introduce a delay of 2 seconds before repeating the loop.

```
void loop() {
  // Clear the buffer
  display.clearDisplay();

  // Set text size
  display.setTextSize(1);

  // Set cursor position
  display.setCursor(0, 0);

  // Display the message
  display.println("Hello World!");
  display.display();

    delay(2000); }
```

Step 4: Uploading the Code

1. Connect the Arduino board to your computer using a USB cable.
2. Click on the "Upload" button in the Arduino IDE to compile and upload the code to the Arduino board.
3. Once the upload is complete, the Arduino board will execute the code, and the text "Hello, Arduino!" will be displayed on the OLED screen.

Congratulations! You have successfully completed the tutorial on writing text on an OLED screen using Arduino. You learned how to set up the circuit, install the required libraries, write the code, and upload it to the Arduino board. Experiment with different text and positions to display dynamic information on the OLED screen. This opens up a wide range of possibilities for creating informative and interactive projects with Arduino and OLED displays!

Exercise

Try to display “Hello, world!” for 2 seconds and then “I am Ready!” for 2 seconds. You will need to display it in different lines as it will not fit on a single line. You also can try to display any messages that you like!