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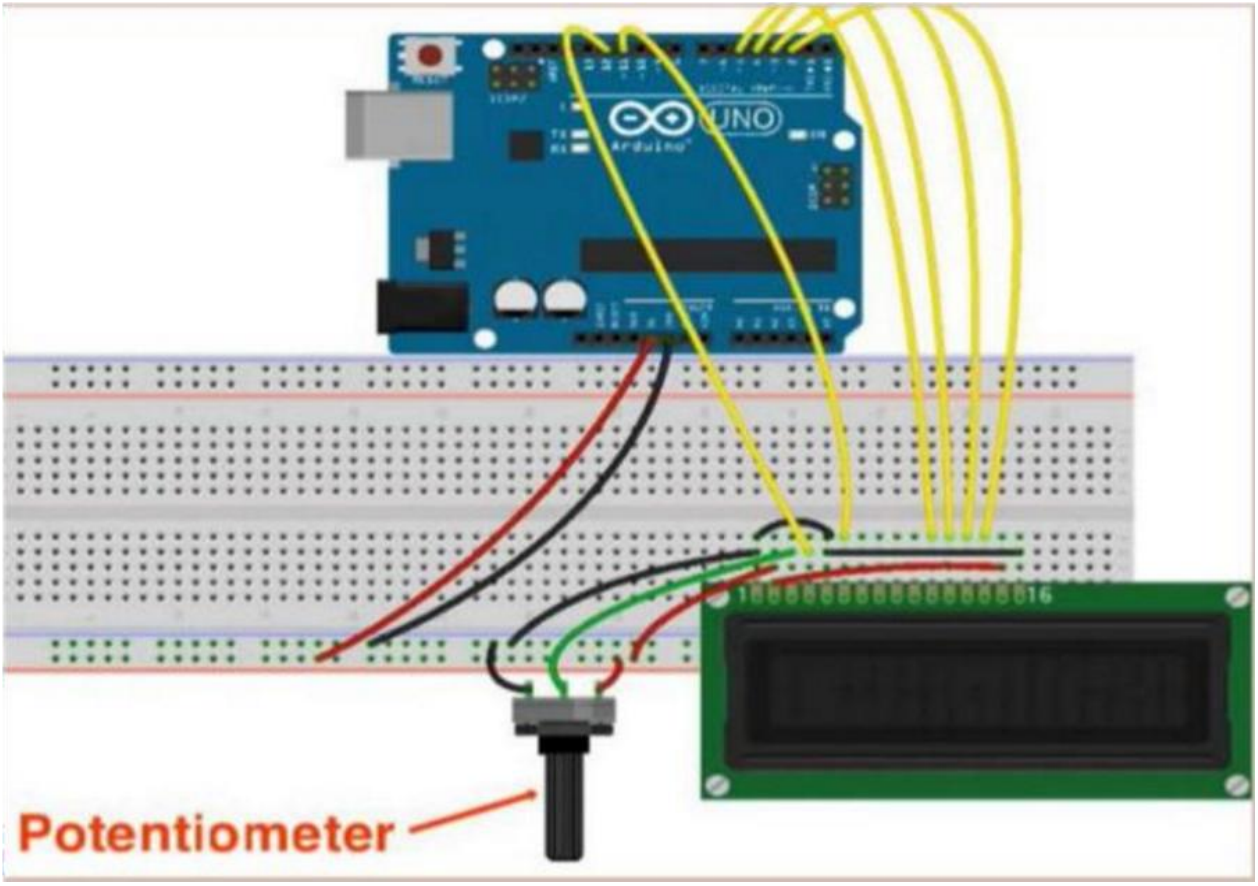
Task: Interfacing of LCD (16*2) with the Arduino Board.

Components:
LCD Display 16x2, Arduino UNO, Jumper wire, Potentiometer, Laptop/PC, Bread Board

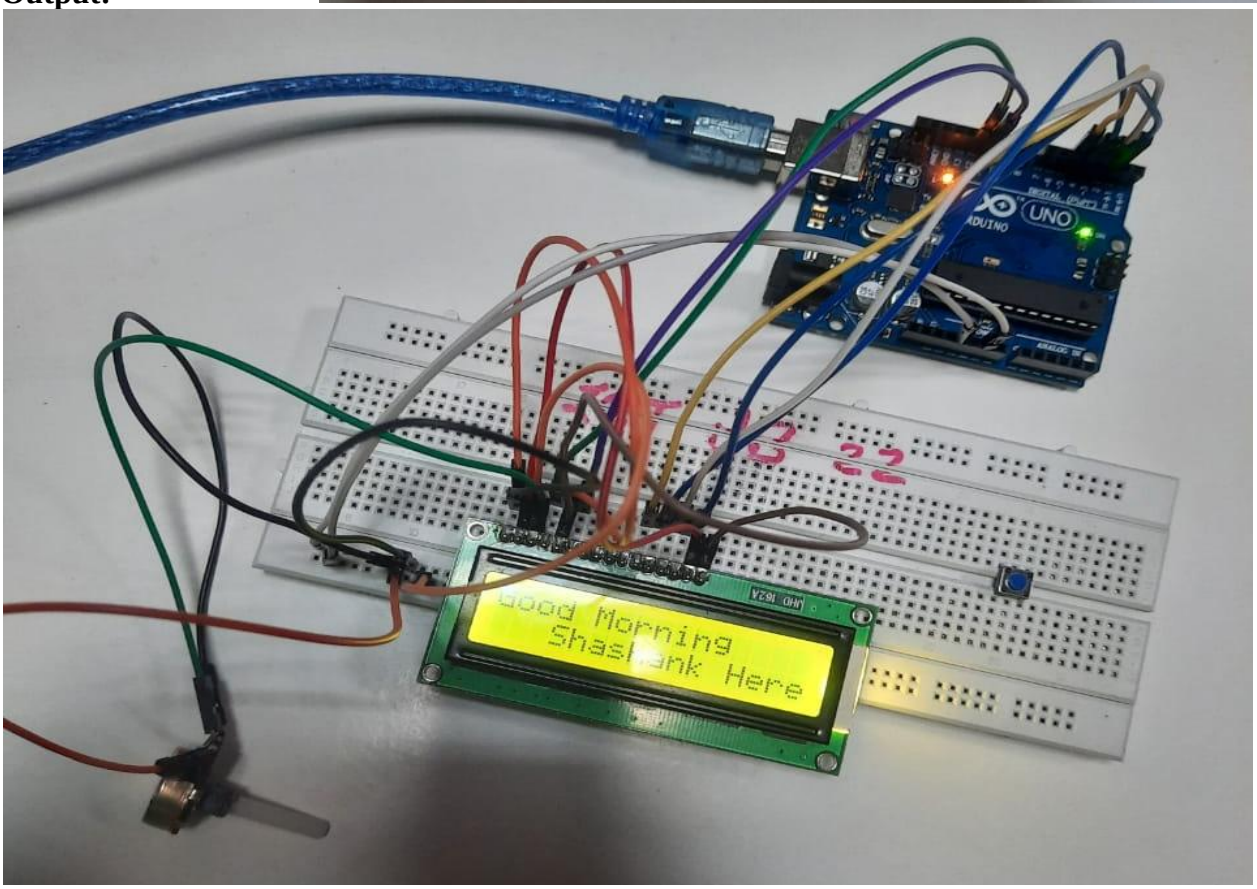
About the Project:

A 16*2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5*7 pixel matrix. The 16*2 intelligent alphanumeric dot matrix display is capable of displaying 224 different characters and symbols. This LCD has two registers, namely Command and Data. It is one kind if electronic display module used in an extensive range of applications like various circuits and devices like mobile phones, calculators, computers, etc. These displays are mainly prefered for multi-segment light-emitting diodes and seven segments. The main benefits of using this module are inexpensive; simply programmable, animations, and there are no limitations for displaying custom characters, special and even animations, etc.
Pin 1 (Ground/ Source Pin): This is a GND pin of display, used to connect the GND terminal of the microcontroller unit or power source.
Pin 2 (VCC / Source pin): This is the voltage supply pin of the display, used to connect the supply pin of the power source.
Pin 3 (V0 / VEE / Control pin): This pin regulates the difference of the display, used to connect a changeable POT that can supply 0 to 5V.
Pin 4 (Register select / Control pin): This pin toggles among command or data register, used to connect a microcontroller unit pin and obtains either 0 or 1(0 = data mode and 1 = command mode).
Pin 5 (Read / Write / Control pin): This pin toggles the display among the read and write operations, and it is connected to a microcontroller unit pin to get either 0 or 1(0 = Write Operation and 1 = Read operation).
Pin 6 (Enable / Control Pin): This pin should be held high to execute Read/Write process, and it is connected to the microcontroller unit and constantly held high.
Pin7-14 (Data Pins): These pins are used to send data to the display. These pins are connected in two-wire modes like 4-wire mode and 8-wire mode. In 4-wire mode, only four pins are connected to the microcontroller unit like 0 to 3, whereas in 8-wire mode, 8-pins are connected to microcontroller unit like 0 to 7.
Pin 15 (+ve pin of the LED): This pin is connected to +5V.
Pin 16 (-ve pin of the LED): This pin is connected to GND.

Schematic:


UNO
Potentiometer

Output:



Code:

```
#include <LiquidCrystal.h>
LiquidCrystal lcd(12 ,11 ,5 , 4, 3 ,2); void setup() {
  // put your setup code here, to run once:
lcd.begin(16,2);   lcd.setCursor(0,0);   lcd.print("Good
Morning");  lcd.setCursor(3,1);
 lcd.print("Shashank Here");
}

void loop() {
  // put your main code here, to run repeatedly:
        }
```

Application:

LCD is used in DVDs, CD players, TV screens, digital watches, digital electronic gadgets, etc. These are also used in screen industries to replace the utilization of CRTs (Cathode Ray Tubes). They are widely used in the industries where the products containing digital screens are build. Some examples are laptop, mobile, digital sensors or measurement devices, where the lcd screen is used this experiments are applicable.

Conclusion:

In this experiment we have discussed the basics of LCD display, how to print characters on an LCD display, by using the lcd.print() function and learned how to scroll through text on a LCD. This is a simple project to learn how to interface a 16*2 LCD with Arduino and utilize this display in many projects where we have to display the output digitally or in a different way rather then serial monitor. We can control the text contrast of the lcd screen using the potentiometer. We can also display, scroll and make some animation on the screen by doing the variation in the code and the output will get the expectation. Thank you so much.

Your Sincerely,
Shashank Bagda