EXPERIMENT 4

Aim:

Implementation of serial communication between an Arduino Uno board and a JHD 16 x 2 LCD display.

Components Required:

1. Arduino Uno
2. JHD 16 x 2 LCD module
3. Bread Board
4. Jump wires
5. USB cable

Theory:

Serial communication is a method of transmitting data between digital devices in which the data is sent one bit at a time sequentially over a communication channel. It is widely used in various applications ranging from simple communication between microcontrollers to complex communication protocols used in computer networks.

The JHD 16x2 LCD module is a commonly used display component in electronic projects due to its simplicity and versatility. It features a 16-character, 2-line configuration, providing ample space for displaying alphanumeric characters, symbols, and basic graphics. With its built-in controller and parallel interface, the module can be easily interfaced with microcontrollers like Arduino, Raspberry Pi, and other embedded systems.

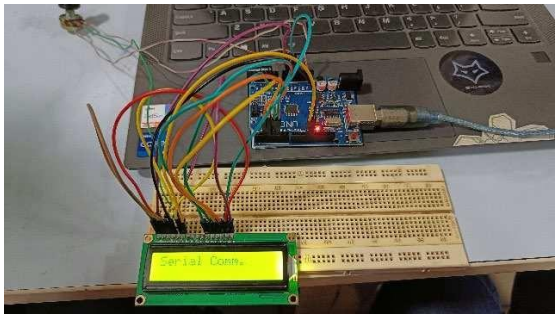
The Arduino Uno board features a built-in Universal Asynchronous Receiver/Transmitter (UART) hardware module that enables serial communication through digital pins 0 (RX) and 1 (TX). These pins are connected to the USB-to-serial converter chip on the Arduino Uno board, allowing communication with a computer via the USB cable. Asynchronous communication means that data is transmitted without the need for a shared clock signal between the sender and receiver. Instead, the sender and receiver agree on a predefined baud rate, which determines the speed of data transmission.

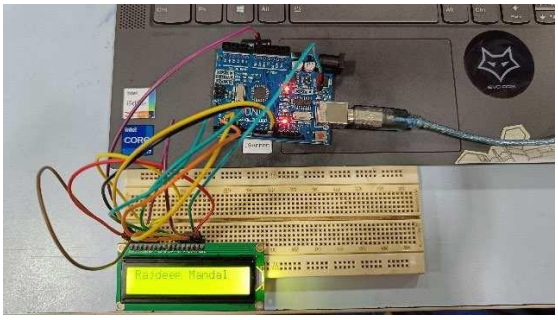
Sketch Code:

```
#include <LiquidCrystal.h>

String entry;

const int rs = 12, en = 11, d4 = 5, d5 = 4, d6 = 3, d7 = 2;

LiquidCrystal lcd(rs, en, d4, d5, d6, d7);


void setup() {
  Serial.begin(9600);
  lcd.begin(16, 2);
}
void loop() {
  if (Serial.available()) {
    entry = Serial.readStringUntil('\n');
    entry.trim();
    lcd.clear();
    lcd.print(entry);
  }
}
```

Result:

Upon successful completion of the experiment, we will be able to send data from the Arduino Uno to the JHD 16 x 2 LCD module using serial communication. The characters or messages sent from the Arduino Uno will be displayed on the LCD screen.





Conclusion:

In this experiment, we have successfully implemented serial communication between an Arduino Uno and a JHD 16 x 2 LCD module. We have learned how to send data from the Arduino Uno to the LCD module using serial communication. This experiment demonstrates the basic principles of serial communication and how it can be utilized to interface with different electronic components for various applications.

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