Course Name: Internet of Things Lab **Course code:** 21CSP-344

Experiment 1.3

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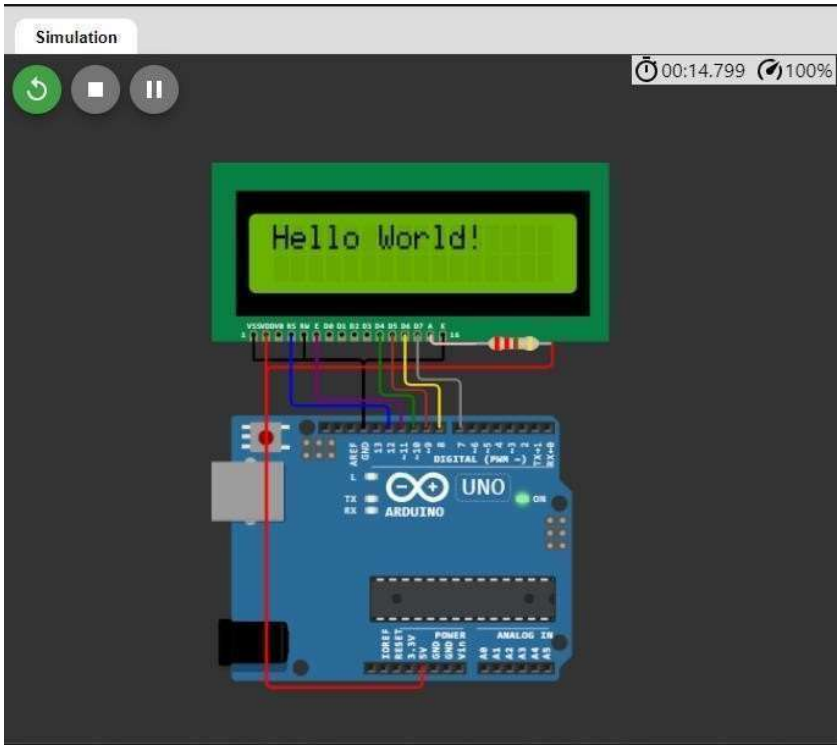
Subject Name: Internet of Things Lab **Subject Code:** 21CSP-344

Aim: Design LCD interfacing on WOKWI or any simulation platform.

Apparatus Used: Arduino Uno, Resistor, LCD.

Diagram:



Theory:

A Liquid Crystal Display (LCD) is a flat-panel display technology that uses a substance called liquid crystal to create images and text. It's widely used in various electronic devices, ranging from calculators and digital watch esto computer monitors and television screens.

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In electronics, the "SDA" (Serial Data Line) and "SCL" (Serial Clock Line) are like the talking and listening parts when devices, like an LCD screen and a microcontroller, need to communicate. SDA is for sending data, and SCL is for keeping everything organized and in sync.
Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects. It has 14 digital input/output pins, 6 analog inputs, a USB connection, a power jack, a reset button etc.

Autodesk Tinkercad Simulation Platform provides a powerful tool for designing, testing, and simulating a wide range of models, from circuits to 3D designs. Its user-friendly interface and intuitive features make it an ideal platform for both novice and experienced designers

LCD Interfacing: To display letters and numbers. ASCII code for the letters A to Z, a to 7, and numbers 0 to 9 is sent to the data lines (D0 -D7). These codes may be sent to LCD data lines through one port of 8255 (PPI), port A is used as the output port and send the data to the LCD.

Code:

```
#include <LiquidCrystal.h>
LiquidCrystal  lcd(12, 11, 10, 9, 8, 7);
      void setup() {
      lcd.begin(16, 2);
      lcd.print("Hello World!");
}
void loop() {
// ...
}
```

Steps:

1. Open Tinkercad and login with your account.
2. Now go to create and select circuit.
3. After this, place an Ardiuno Uno board and an LCD 16x2(12c).
4. Now, make the require connections:

i. Connect the ground pin of LCD to the ground pin of Ardiuno Uno board
ii. Connect the power pin(VCC) of LCD with 5V power pin of microcontroller.
iii. Connect the SDA pin to A4 pin iv. SCL pin to A5 analog pin in microcontroller.

5. After that we need to put the code, for that go to the code icon on top right corner and put the code as required.
6. Run the simulation and see the result.

Result:
LCD interfacing was successfully done in the WOKWI platform using Arduino and a LiquidCrystal Display.

Learning Outcomes:

- Learned about IOT applications.
- Learned about different types of sensors and their uses.
- Learned about WOKWI platform.
- Learned about LCD interfacing.