**Internet of Things**

**Lab Report 7**

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**INTRODUCTION:**

In this lab we will connect an LCD (Liquid Crystal Display) to the NodeMCU board in this lab project. These 16x2 LCDs are often used in electronics and Internet of Things projects since they are excellent for showing information like sensor data from your project and are also quite affordable.The ground is connected to the LCD's R/W pin. The LCD module's enable signal pin is wired to pin 11 of the Arduino. In this project, the 4-bit mode is interfaced with the LCD module and Arduino module. As a result, the LCD has four input lines, numbered DB4 to DB7.

**OBJECTIVES:**

To learn about IoT (Internet of Things) NODEMCU LCD Interfacing with Arduino Development Boards.

**Lab code:**

#include <ThingSpeak.h> // add librery

#include <ESP8266WiFi.h>

//sketch created by Akshay Joseph

#include <Wire.h>

#include <LiquidCrystal\_I2C.h>

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

void setup()

{

lcd.begin();

lcd.backlight();

lcd.clear();

lcd.setCursor(4,0);

lcd.print("Hackster");

}

void loop()

{

}

**Application:**

There are two ways to control Hitachi-compatible LCDs:8 bits or 4 bits?The Arduino requires seven I/O pins for the 4-bit mode, while 11 are required for the 8-bit mode.In 4-bit mode, you can do almost everything for text display on the screen. This example shows how to control a 16x2 LCD in 4-bit mode.

* Display text on LCD.
* LCD Cursor Setting with Arduini.
* Scrolling Text on 16×2 LCD using Arduino.
* Displaying Custom Characters on 16×2 LCD LCD using Arduino.
* A way Custom Characters to store LCD Memory.
* Custom Characters Generation for 16×2 LCD and Arduino.
* Write Serial Data on 16×2 LCD using Arduino.

**Issues:**

we never find any issue regarding this lab.

**Conclusion:**

In this lab we perform IoT (Internet of Things) based experiment NODEMCU LCD Interfacing with Arduino Development Boards. To interface LCD to the Arduino, we need Liquid crystal library. The LCD module is use liquid crystal to print visible text on display, mainly this display are used for DIY project.