

# UNIVERSITY OF SCIENCE - VNUHCM

## Faculty of Information Technology

# INTERNET OF THINGS

## 1.10

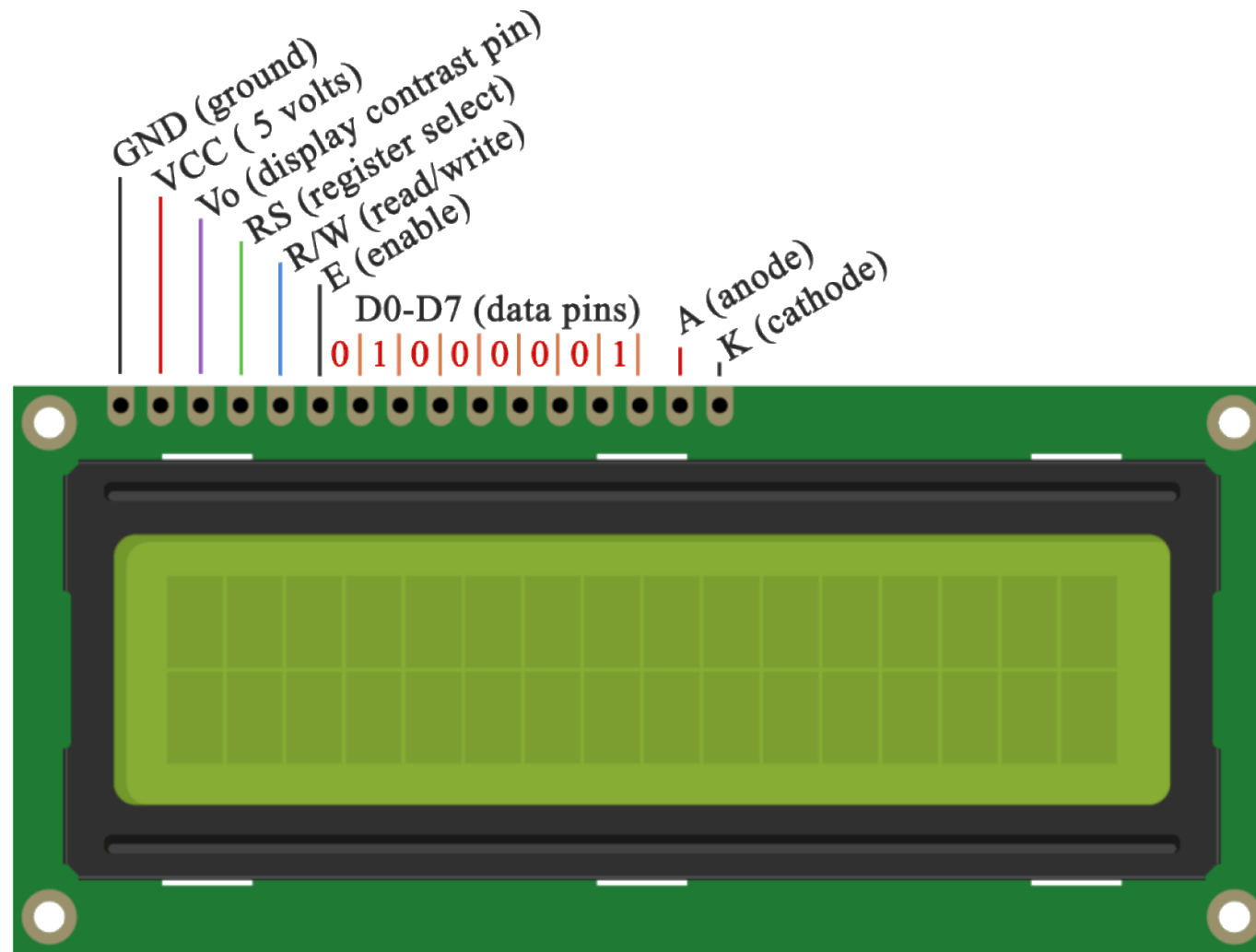
## LCD

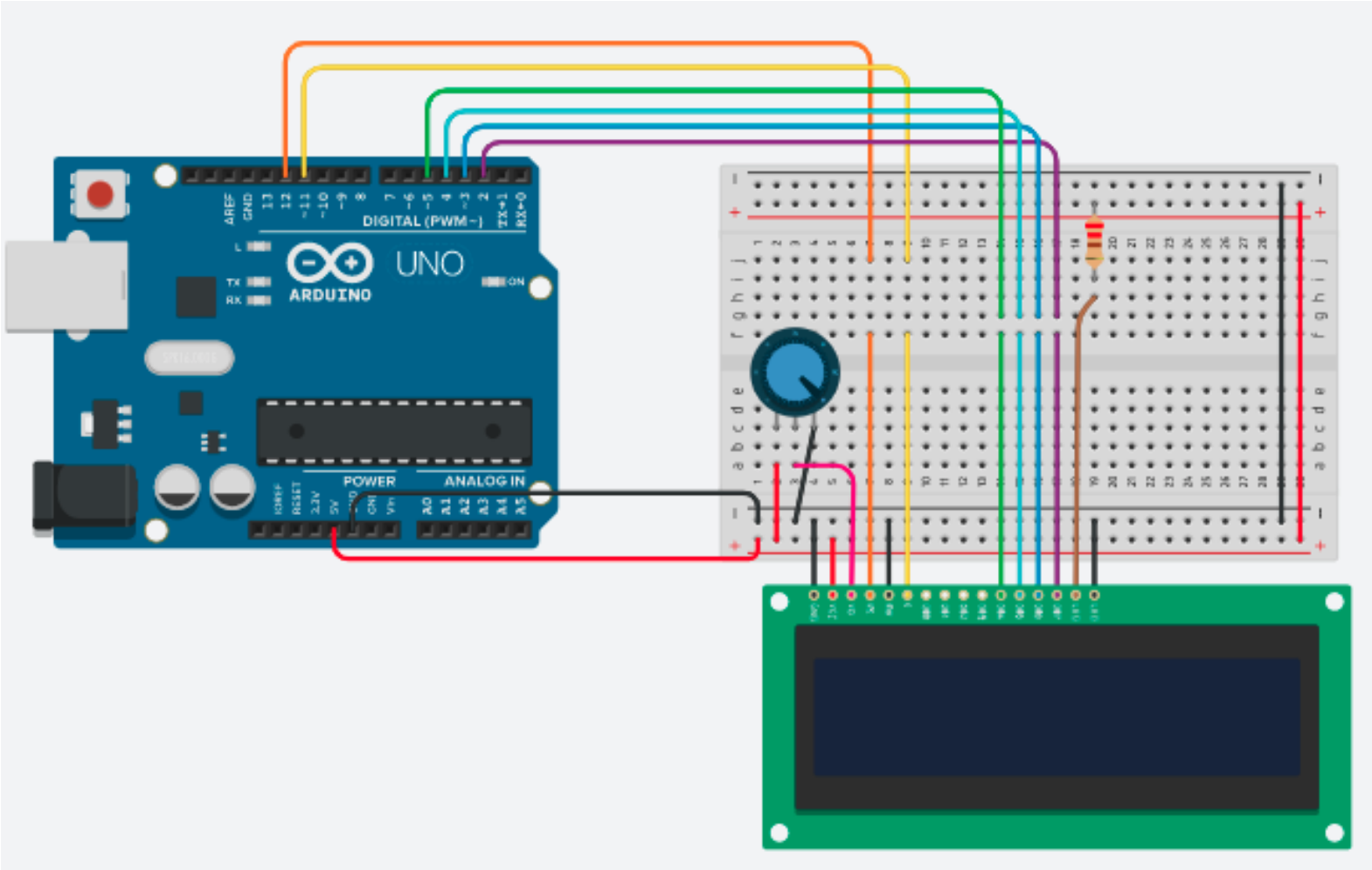
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LCD  
Liquid Crystal  
Display





LCD Module	Arduino Pin	Potentiometer
VSS	GND	1
VDD	5v	3
V0		2
RS	12	
RW	GND	
E	11	
D4	5	
D5	4	
D6	3	
D7	2	
A	5V	
K	GND	

Upper 4bit Lower 4bit		LLLL	LLLH	LLHL	LLHH	LHLL	LHLH	LHHL	LHHH	HLLL	HLLH	HLHL	HLHH	HHLL	HHLH	HHHL	HHHH
LLLL	CG RAM (1)																
LLLH	(2)																
LLHL	(3)																
LLHH	(4)																
LHLL	(5)																
LHLH	(6)																
LHHL	(7)																

```
// include the library code:
#include <LiquidCrystal.h>

// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

void setup() {
    // set up the LCD's number of columns and rows:
    lcd.begin(16, 2);
    // Print a message to the LCD.
    lcd.print("hello, world!");
}

void loop() {
    // set the cursor to column 0, line 1
    // (note: line 1 is the second row, since counting begins with 0):
    lcd.setCursor(0, 1);
    // print the number of seconds since reset:
    lcd.print(millis() / 1000);
}
```

# LiquidCrystal library

Autoscroll

Blink

Cursor

Display

Scroll

**Reference:**

**<https://www.arduino.cc/en/Reference/LiquidCrystal>**



# Display Temperature + Humidity on LCD

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# LCD I2C

SDA → A4  
SCL → A5

# LiquidCrystal I2C

A library for I2C LCD displays.

Author	Frank de Brabander
Maintainer	Marco Schwartz
Website	<a href="https://github.com/marcoschwartz/LiquidCrystal_I2C">https://github.com/marcoschwartz/LiquidCrystal_I2C</a>
Github	<a href="https://github.com/johnrickman/LiquidCrystal_I2C">https://github.com/johnrickman/LiquidCrystal_I2C</a>
Category	Display
License	Unknown
Library Type	Contributed
Architectures	avr

The library allows to control I2C displays with functions extremely similar to LiquidCrystal.

## Downloads

### Filename

[LiquidCrystal\\_I2C-1.1.2.zip](#)

[LiquidCrystal\\_I2C-1.1.1.zip](#)

## Install library

- Download  
LiquidCrystal\_I2C-x.x.x.zip
- Open Arduino IDE, select **Sketch > Include Library > Add .Zip Library** > select zip file.

Link download:

<https://www.arduinolibraries.info/libraries/liquid-crystal-i2-c>

```
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd(0x27,16,2);
```

```
void setup()
{
    lcd.init();
    lcd.setCursor(0,0);
    lcd.print("Hello World");
}
```



0x27 or 0x3F

```
void loop()
{
    lcd.backlight();
    delay(1000);
    lcd.noBacklight();
    delay(1000);
}
```