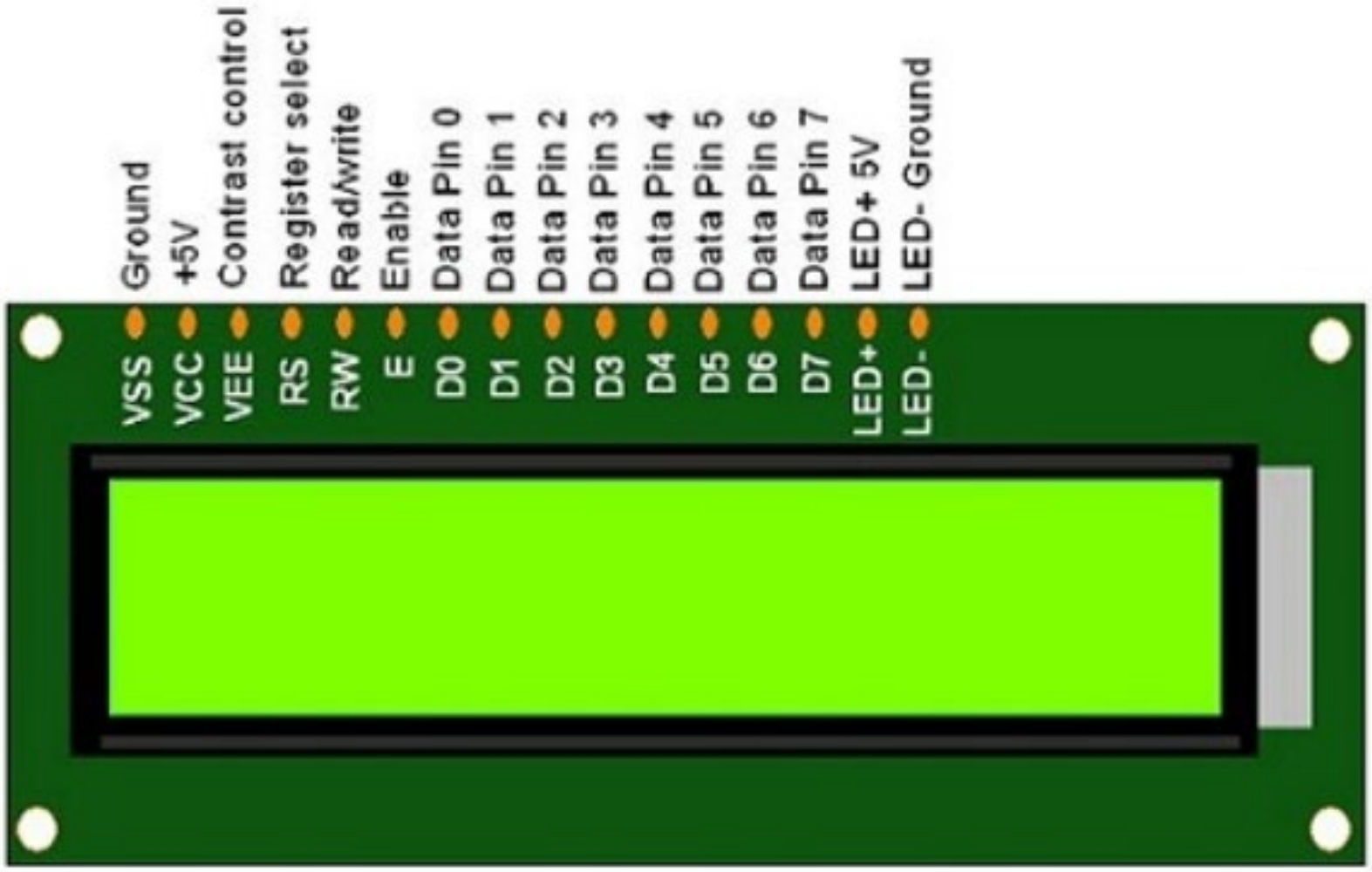
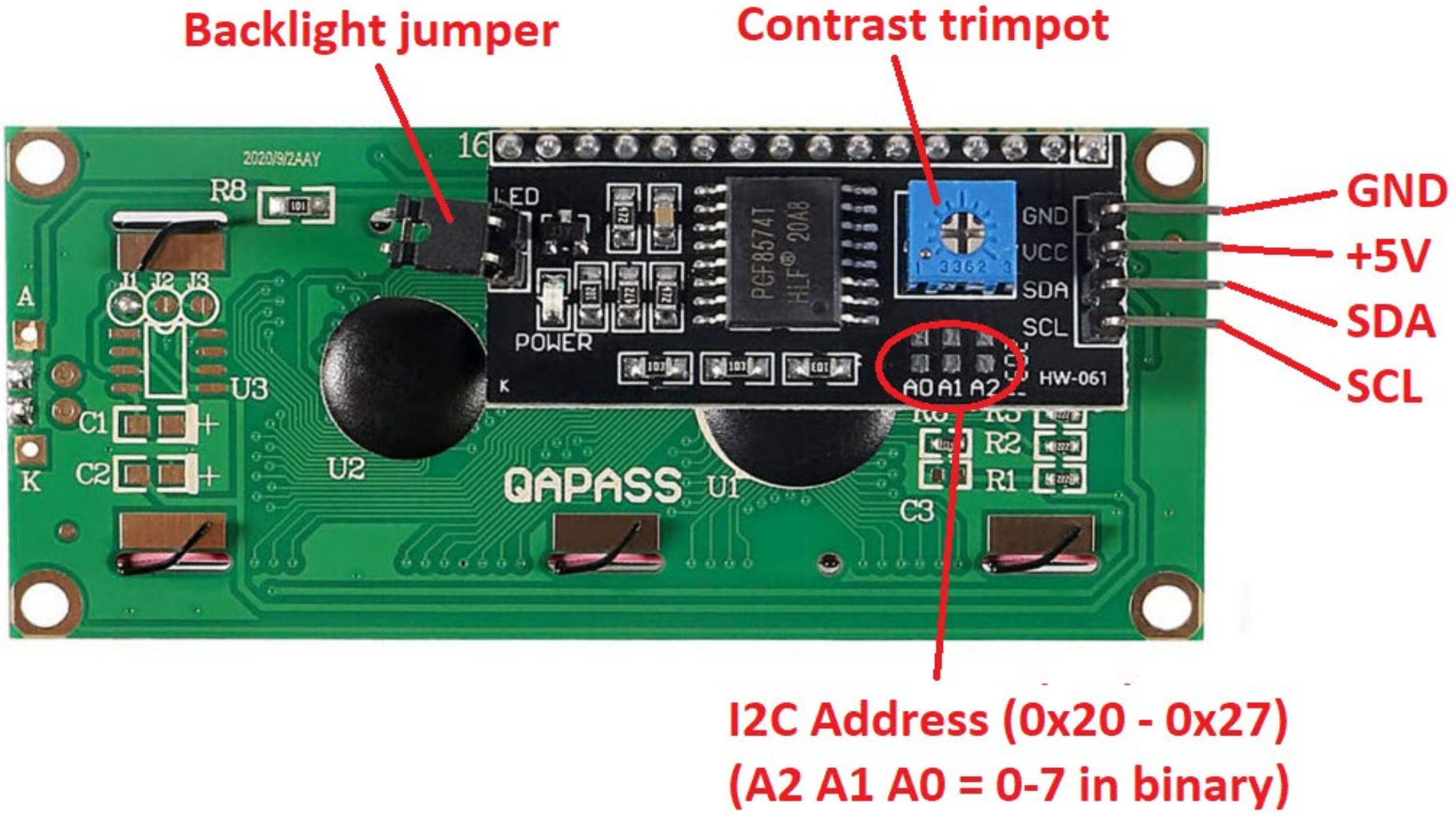
Microcontrollers & Applications

Lecture 5.2: Liquid Crystal Display (LCD)

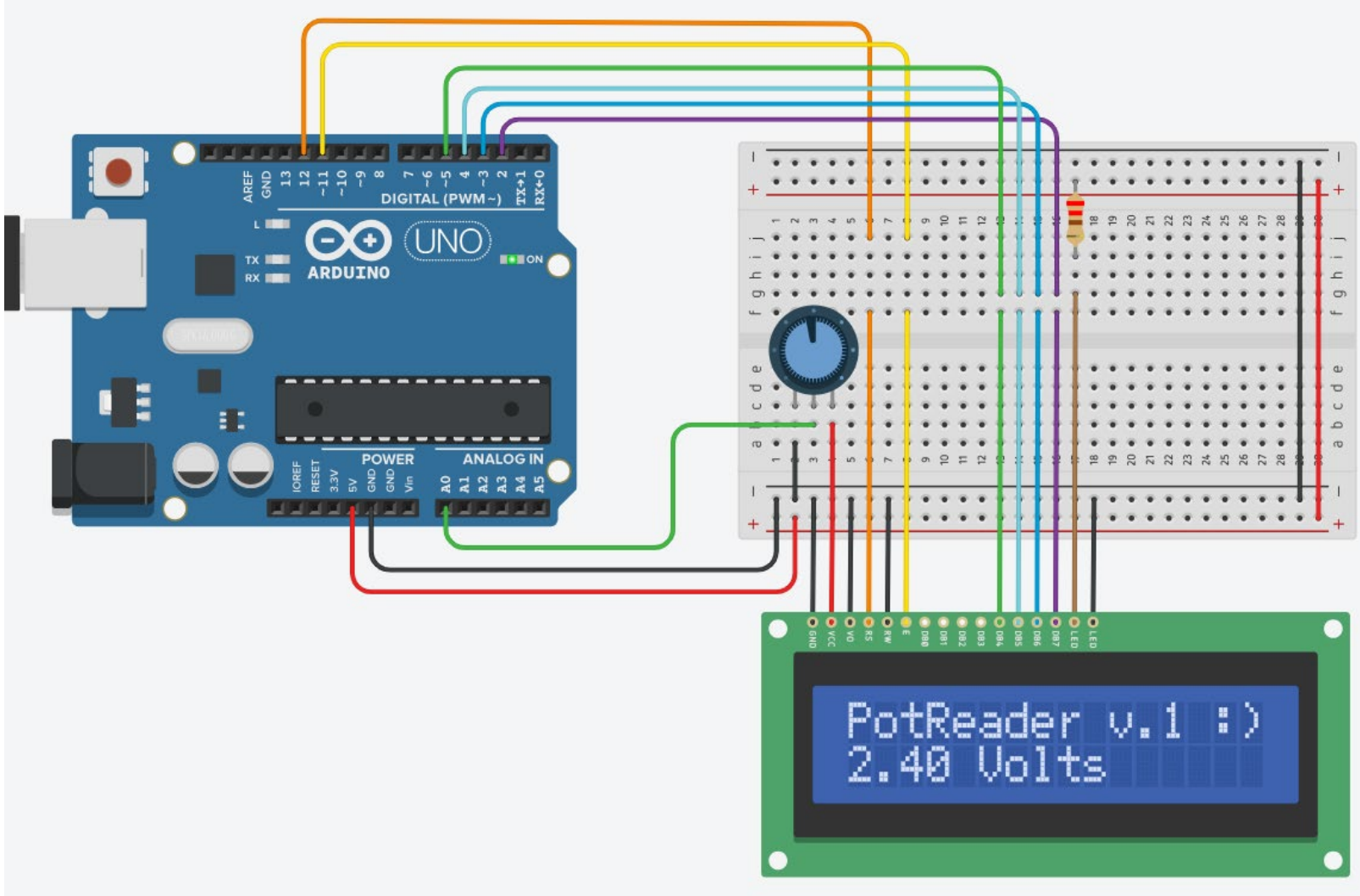
Liquid Crystal Display (LCD): Parallel Structure



Liquid Crystal Display (LCD): I2C Structure



LCD: Arduino Example (1)



LCD: Arduino Example (2)

```
/*
 @2024
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 The circuit:
* LCD RS pin to digital pin 12
* LCD Enable pin to digital pin 11
* LCD D4 pin to digital pin 5
* LCD D5 pin to digital pin 4
* LCD D6 pin to digital pin 3
* LCD D7 pin to digital pin 2
* LCD R/W pin to ground
* LCD VSS pin to ground
* LCD VCC pin to 5V
* 10K resistor:
* ends to +5V and ground
* wiper to LCD VO pin (pin 3)

This example code is in the public domain.

*/

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

#define POT A0

// initialize the library with the numbers of the interface pins
// LiquidCrystal lcd(RS, E, D4, D5, D6, D7);
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
```
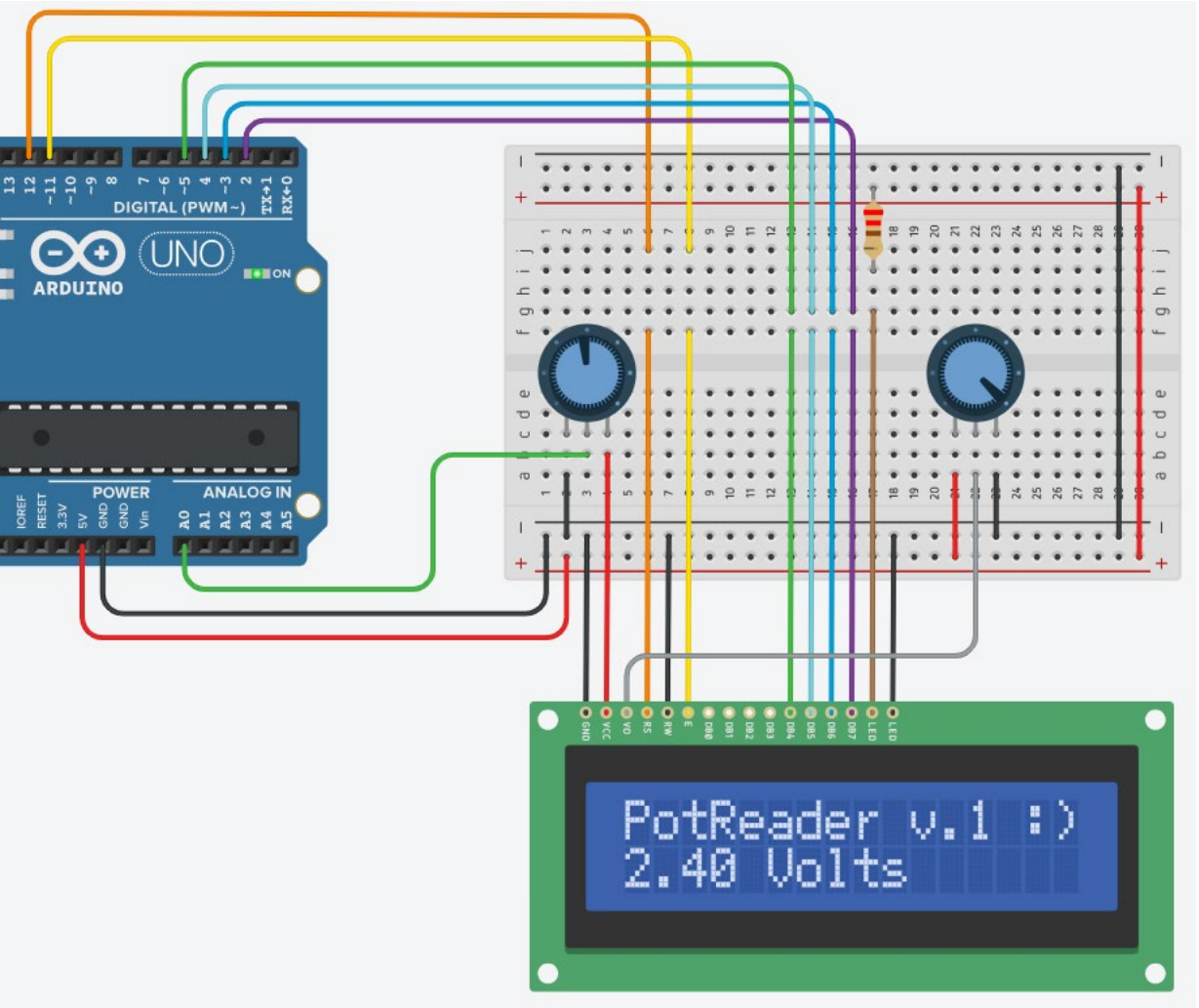
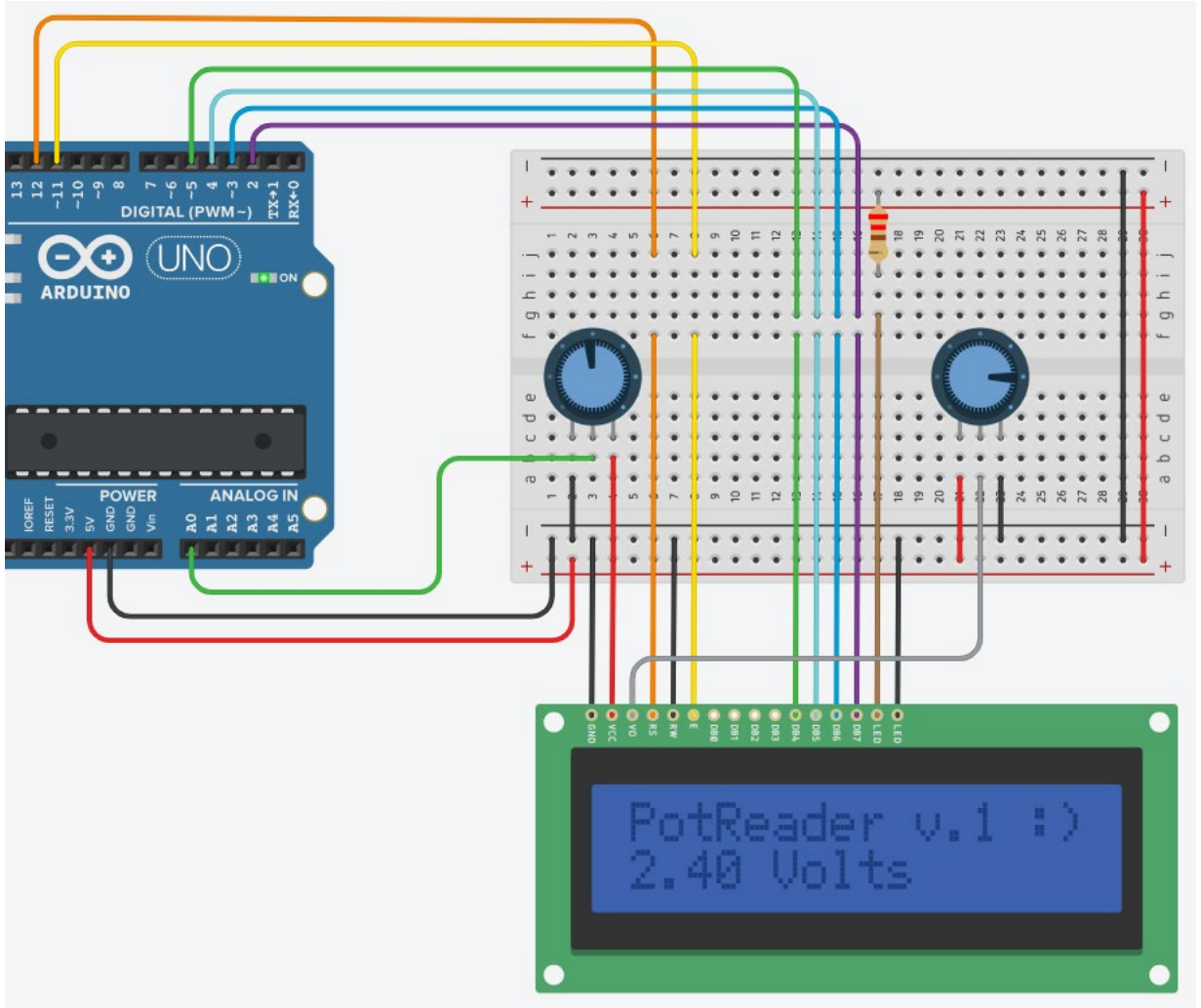

LCD: Arduino Example (3)

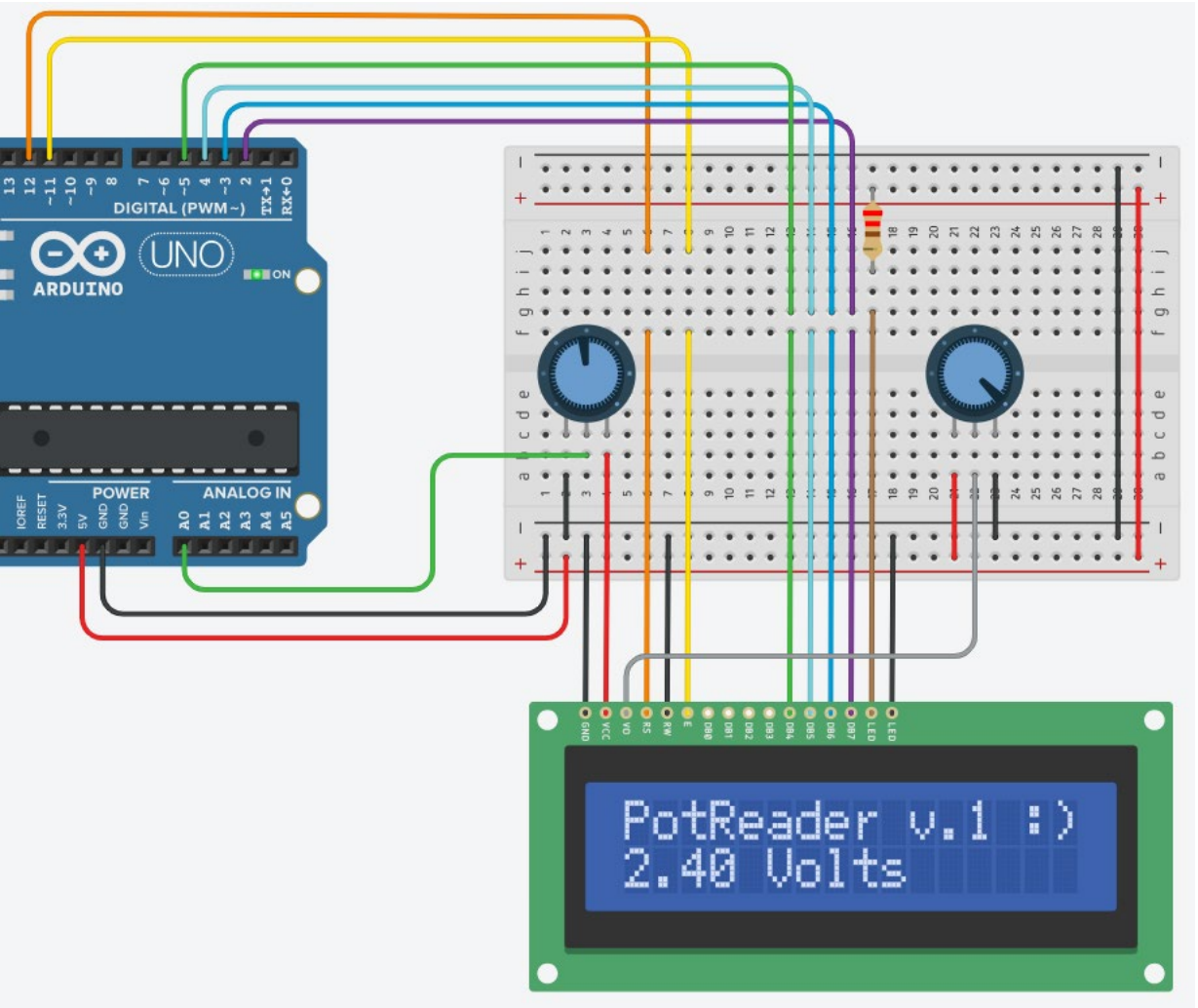
```
void setup() {
  // set up the LCD's number of columns and rows:
  lcd.begin(16, 2);
  // Print a message to the LCD.
  lcd.print("PotReader v.1 :)");
}

void loop() {
  int pot_value = analogRead(POT);

  // Note that: not 1023, must be 1023.0;
  // otherwise you will see 0.0 V and 5.0 V only :)
  float voltage_value = pot_value / 1023.0 * 5.0;

  // set the cursor to column 0, line 1
  // (note: line 1 is the second row, since counting begins with 0)
  lcd.setCursor(0, 1);
  lcd.print(voltage_value);
  lcd.print(" Volts");
}
```

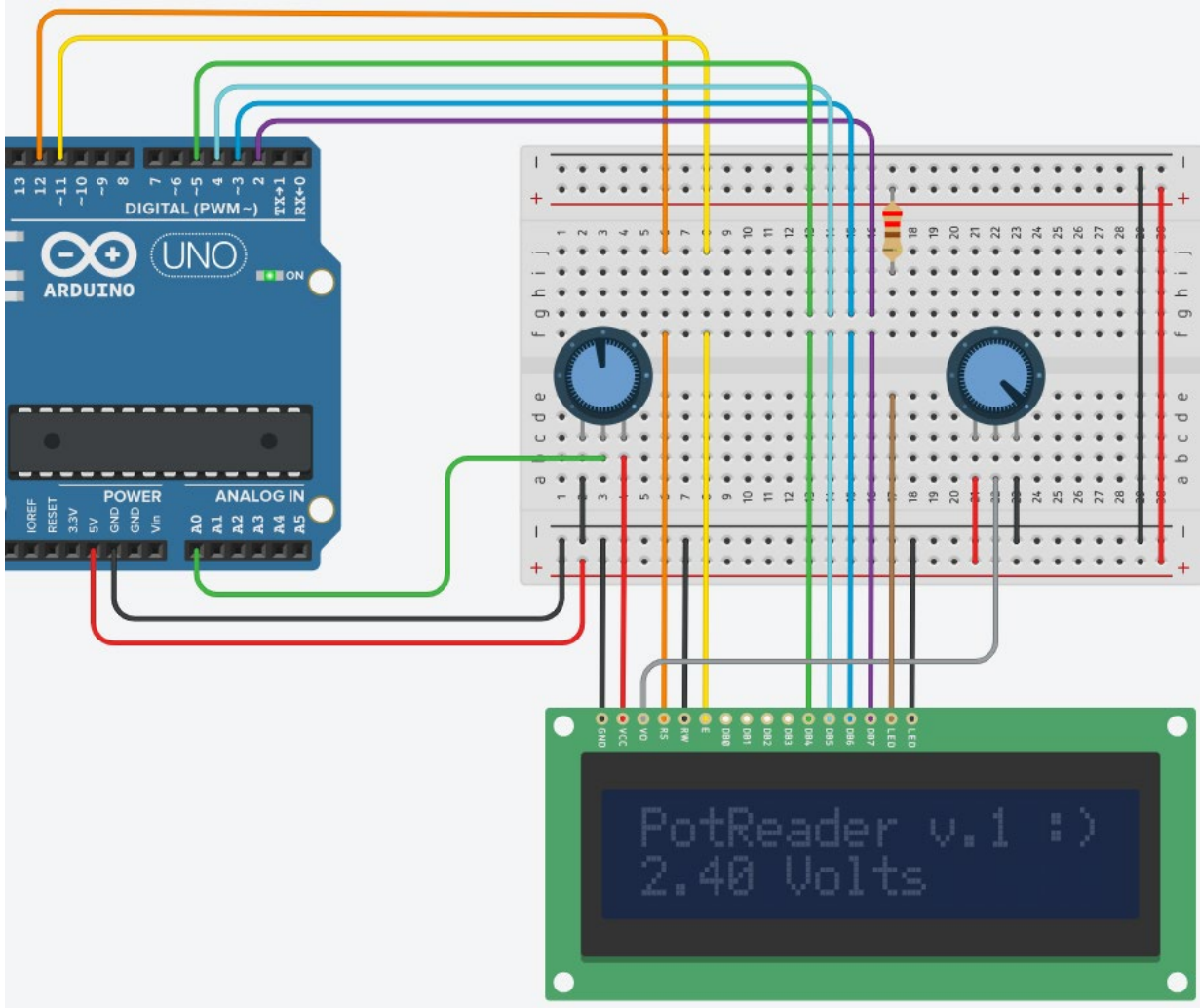
LCD: Contrast Control



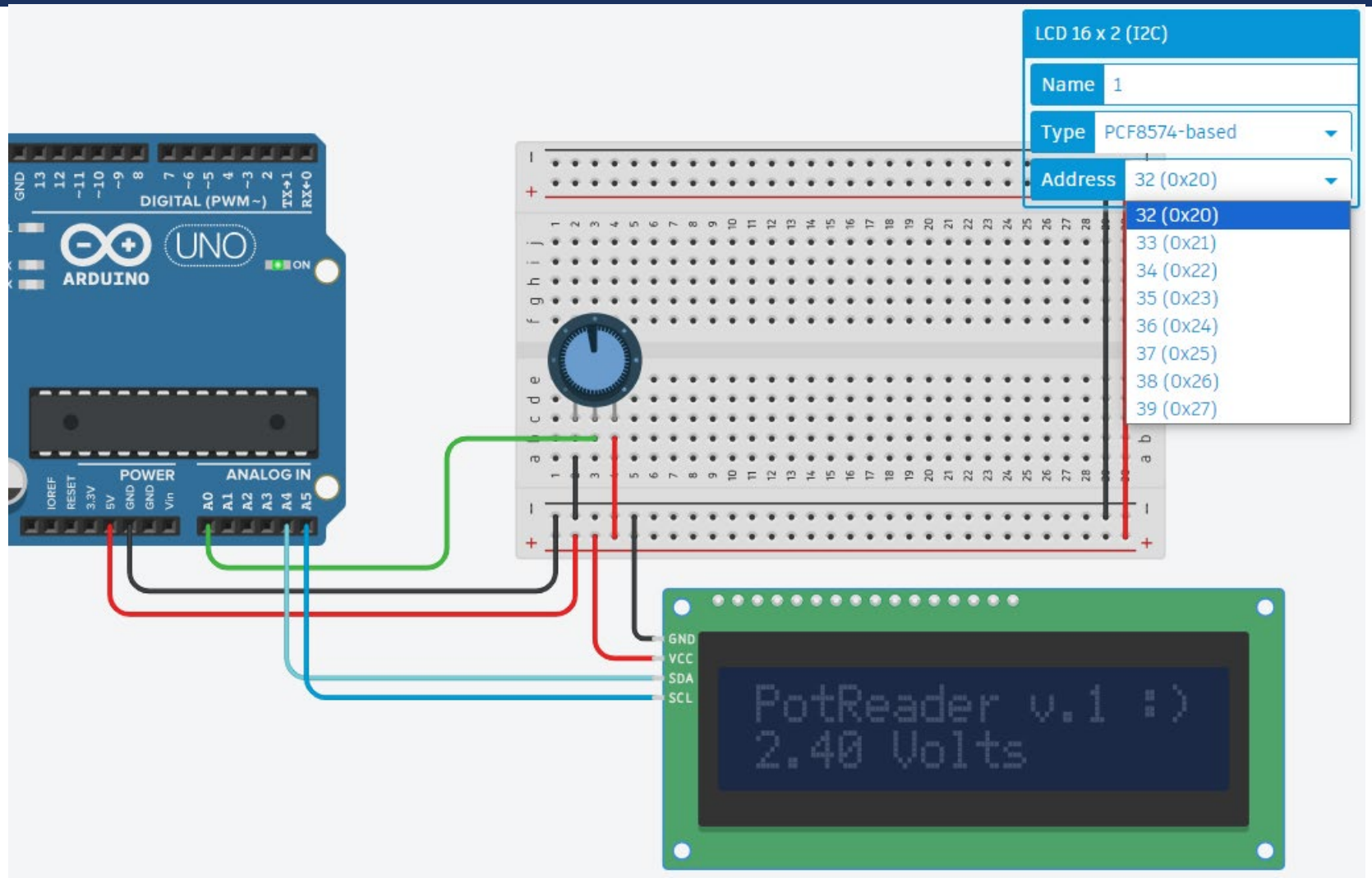


LCD: Backlight LED Control





I2C LCD: Arduino Example (1)



I2C LCD: Arduino Example (2)

```
/*
  @2024
  @Yalcin Isler (www.islerya.com)
 */

// include the LiquidCrystal_I2C library:
#include <LiquidCrystal_I2C.h>

#define POT A0

// initialize the library
// LiquidCrystal_I2C lcd(address, Ncols, Nrows);
LiquidCrystal_I2C lcd(0x20, 16, 2);

void setup() {
  lcd.init();
  // Print a message to the LCD.
  lcd.print("PotReader v.1 :)");
}

void loop() {
  int pot_value = analogRead(POT);

  // Note that: not 1023, must be 1023.0;
  // otherwise you will see 0.0 V and 5.0 V only :)
  float voltage_value = pot_value / 1023.0 * 5.0;

  // set the cursor to column 0, line 1
  // (note: line 1 is the second row, since counting begins with 0)
  lcd.setCursor(0, 1);
  lcd.print(voltage_value);
  lcd.print(" Volts");
}
```

LCD & I2C LCD: Reference Documents

- https://www.arduino.cc/reference/en/libraries/liquidcrystal/
- https://www.arduino.cc/reference/en/libraries/liquidcrystal-i2c/

Arduino: Library Use

- The Arduino environment can be extended through the use of libraries, just like most programming platforms. Libraries provide extra functionality for use in sketches, e.g. working with hardware or manipulating data.
- To use a library in a sketch, select it from Sketch > Import Library.
- A number of libraries come installed with the IDE, but you can also download or create your own. See these instructions for details on installing libraries.
- There is also a tutorial on writing your own libraries. See the API Style Guide for information on making a good Arduino-style API for your library.

Communication (1451)

Data Processing (411)

Data Storage (176)

Device Control (1185)

Display (580)

Other (590)

Sensors (1352)

Signal Input/Output (519)

Timing (252)

Uncategorized (251)

LCD: Using Turkish Characters

- Original Post (thanks for Mete Hoca):

  https://www.metehoca.com/akademi/arduino-modul/arduino-lcd-ekranda-turkce-karakterler-nasil-kullanilir-782/

- Alternative Links to download libraries (thanks for Semih Saçı):

  https://me.islerya.com/files/microcontrollers/LiquidCrystalTr.zip

  https://me.islerya.com/files/microcontrollers/LiquidCrystalTr_I2C.zip

- Change in your code (thanks for Mete Hoca and Semih Saçı):
  - #include <LiquidCrystal.h> to #include <LiquidCrystalTr.h>
  - #include <LiquidCrystal_I2C.h> to #include <LiquidCrystalTr_I2C.h>

Thanks for listening ☺

YALÇIN İŞLER

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