Advanced Embedded Systems

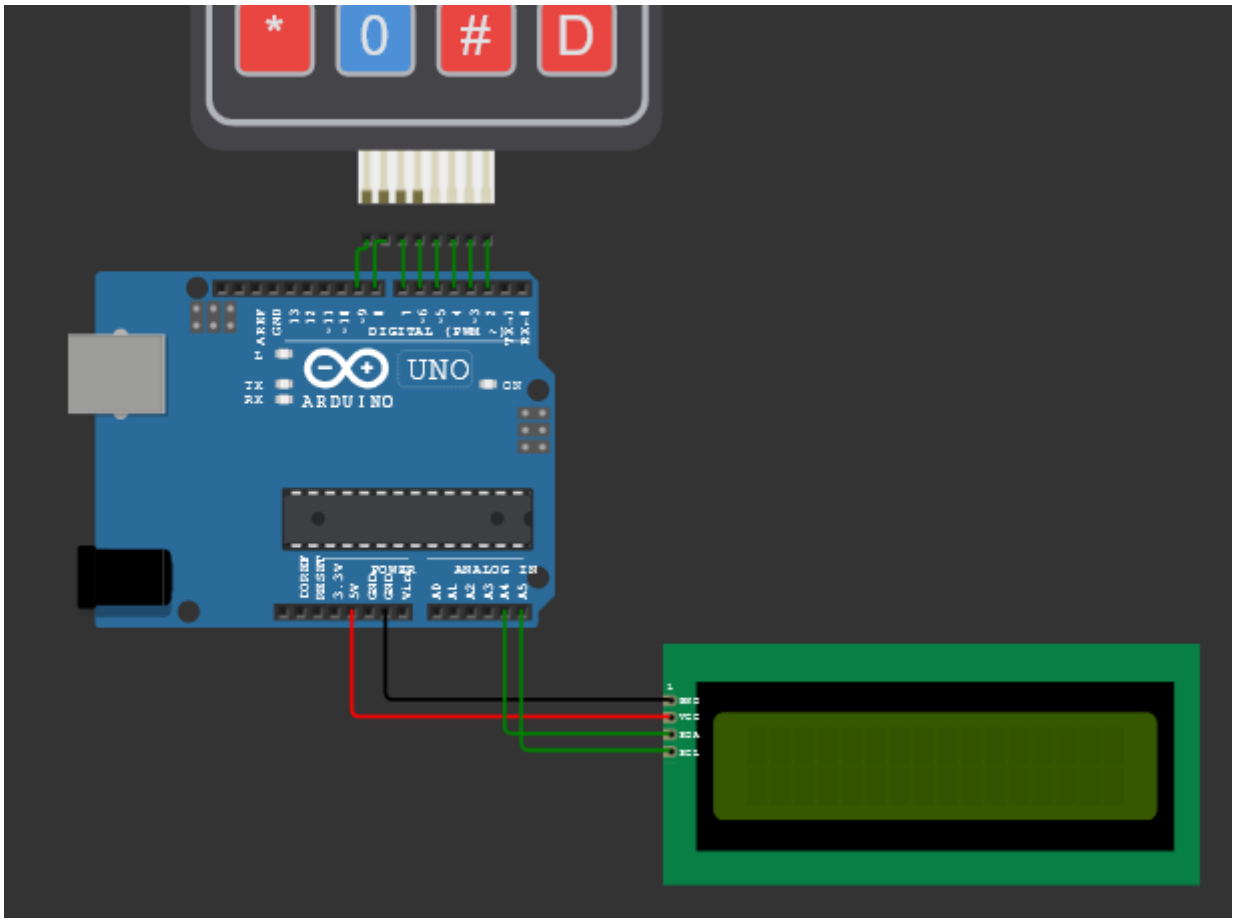
Mini Project

Aim: Using a LCD monitor and a 4 x 4 Keypad with Arduino.

Components:

- Arduino UNO (1x).
- USB 2.0 Cable Type A/B (1x).
- LCD I2C (16 rows, 2 columns) (1x).
- Keypad (4 x 4) (1x).
- Jump Wires (Male / Female) (12x).

Circuit Diagram:



Connections:

Groups	Pins	
	From	To
Arduino to Keypad	2	C4
	3	C3
	4	C2
	5	C1
	6	R4
	7	R3
	8	R2
	9	R1

Arduino to LCD	5V	V_{CC}
	GND	GND
	A4	SDA
	A5	SCL

Source Code:

```
#include <Keypad.h>
#include <LiquidCrystal_I2C.h>

const int ROW_COUNT    = 4; // four rows
const int COLUMN_COUNT = 4; // four columns

char keyMap[ROW_COUNT][COLUMN_COUNT] = {
  {'1','2','3', 'A'},
  {'4','5','6', 'B'},
  {'7','8','9', 'C'},
  {'*','0','#', 'D'}
};

byte pinRows[ROW_COUNT] = {9, 8, 7, 6};      // connect to the row
pinouts of the keypad
byte pinColumns[COLUMN_COUNT] = {5, 4, 3, 2}; // connect to the column
pinouts of the keypad

Keypad keypad = Keypad(makekeyMap(keyMap), pinRows, pinColumns,
ROW_COUNT, COLUMN_COUNT);
```

```
LiquidCrystal_I2C lcdDisplay(0x27, 16, 2); // I2C address 0x27, 16 column and 2 rows

int cursorColumn = 0;

void setup(){
     // initialize the LCD.
     lcdDisplay.init();
     lcdDisplay.backlight();
}

void loop(){
  char key = keypad.getKey();

  if (key) {
    lcdDisplay.setCursor(cursorColumn, 0); // move cursor to (cursorColumn, 0)
    lcdDisplay.print(key);                 // print key at (cursorColumn, 0)

    cursorColumn++;                  // move cursor to next position
    if(cursorColumn == 16) {         // if all columns are used, clear the lcd
      lcdDisplay.clear();
      cursorColumn = 0;
    }
  }
```

```
}
```

Note: The project link can be found here.