Advanced Embedded System Mini Project

Aim:

To display numbers on LCD display which are being key pressed on keypad.

Description:

- Arduino :

  Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board and a piece of software, or IDE runs on your computer, used to write and upload computer code to the physical board. Arduino UNO has 14 digital pins and 6 analog pins.

- Breadboard :

  It is a way of constructing electronics without having to use a soldering iron. Components are pushed into the sockets on the breadboard and then extra 'jumper' wires are used to make connections.

- LCD:

  A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals combined with polarizer's. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in colour or monochrome. It is 16*2 LCD display. That is it has 16 columns and 2 rows.
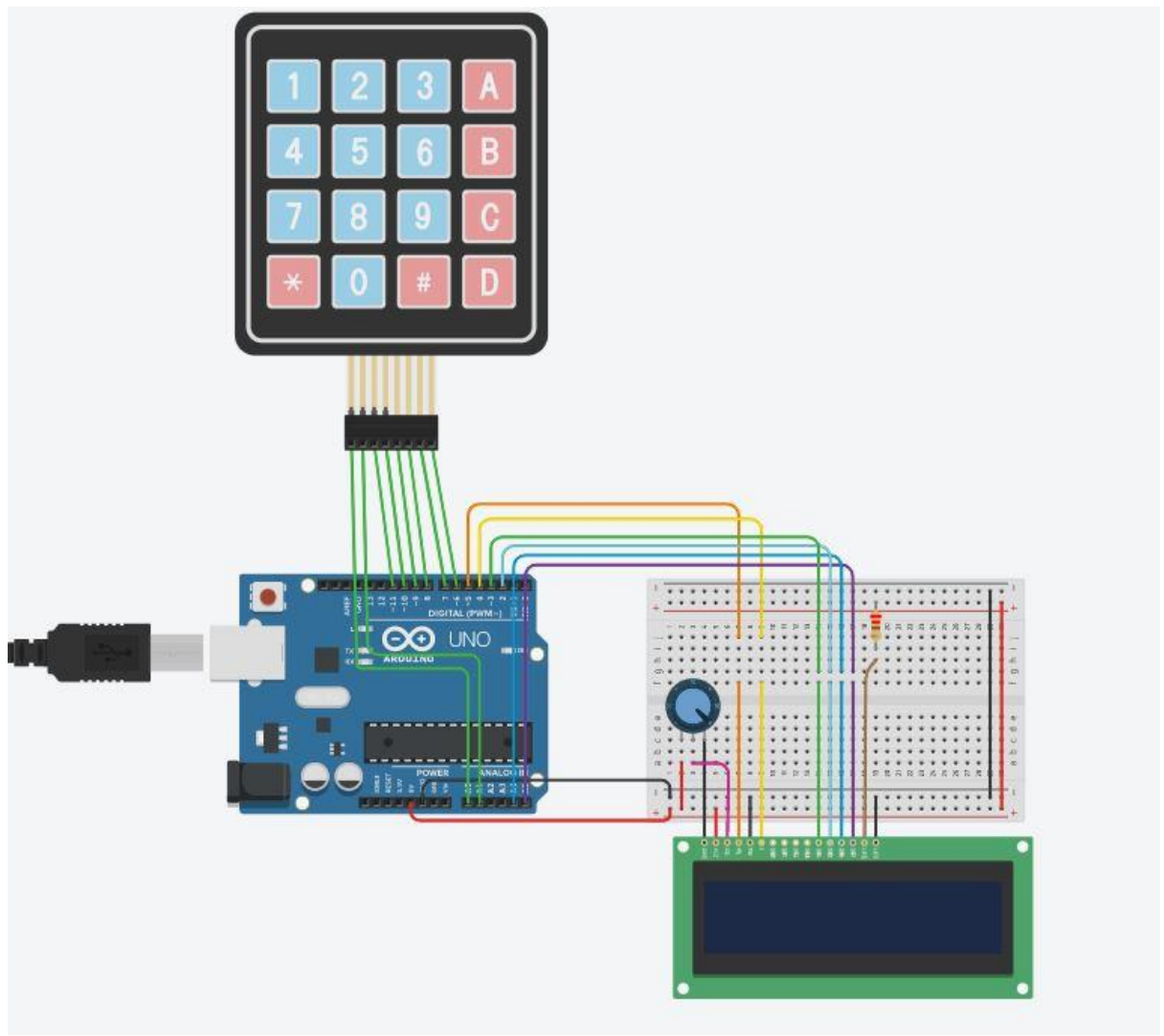
- Keypad :

  The buttons on a keypad are arranged in rows and columns. A

3X4 keypad has 4 rows and 3columns, and a 4X4 keypad has 4 rows and 4 columns.Keypad 4x4 is used for loading numerics into the microcontroller. It consists of 16 buttons arrangedin a form of an array containing four lines and four columns. It is connected to the development system by regular IDC 10 female connector plugged in some development system's port.

Hardware Requirement:

- Arduino
- LCD
- Breadboard
- Keypad
- Jump Wires

Hardware Configurations:

Code:

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

LiquidCrystal lcd(5, 4, 3, 2, A4, A5);

const byte ROWS = 4; //four rows
const byte COLS = 4; //three columns
char keys[ROWS][COLS] = {
  {'1','2','3','A'},
```

```
   {'4','5','6','B'},

   {'7','8','9','C'},

   {'*','0','#','D'}

};


byte rowPins[ROWS] = {A0, A1, 11, 10}; //connect to the row
pinouts of the keypad

byte colPins[COLS] = {9, 8, 7, 6}; //connect to the column pinouts of
the keypad

int LCDRow = 0;

Keypad keypad = Keypad( makeKeymap(keys), rowPins, colPins,
ROWS, COLS );


void setup(){
  Serial.begin(9600);
  lcd.begin(16, 2);
  lcd.setCursor(LCDRow, 0);
  }


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

 if (key){
   Serial.println(key);
   lcd.print(key);
   lcd.setCursor (++LCDRow, 0);
 }
}
```
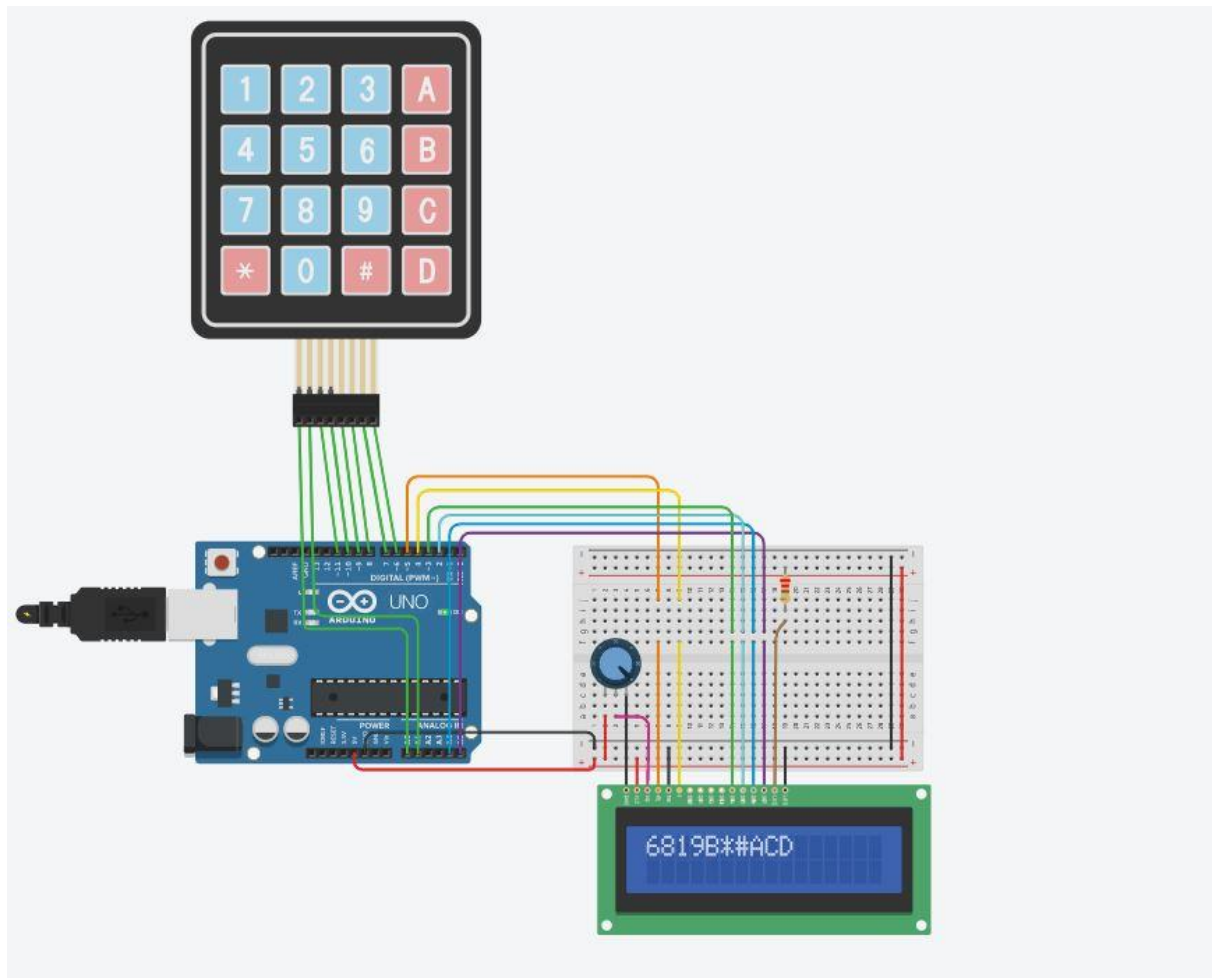
Output:

Tinkercad Simulator:

https://www.tinkercad.com/things/70aocR3CDxG-aesminiprojectprince/editel