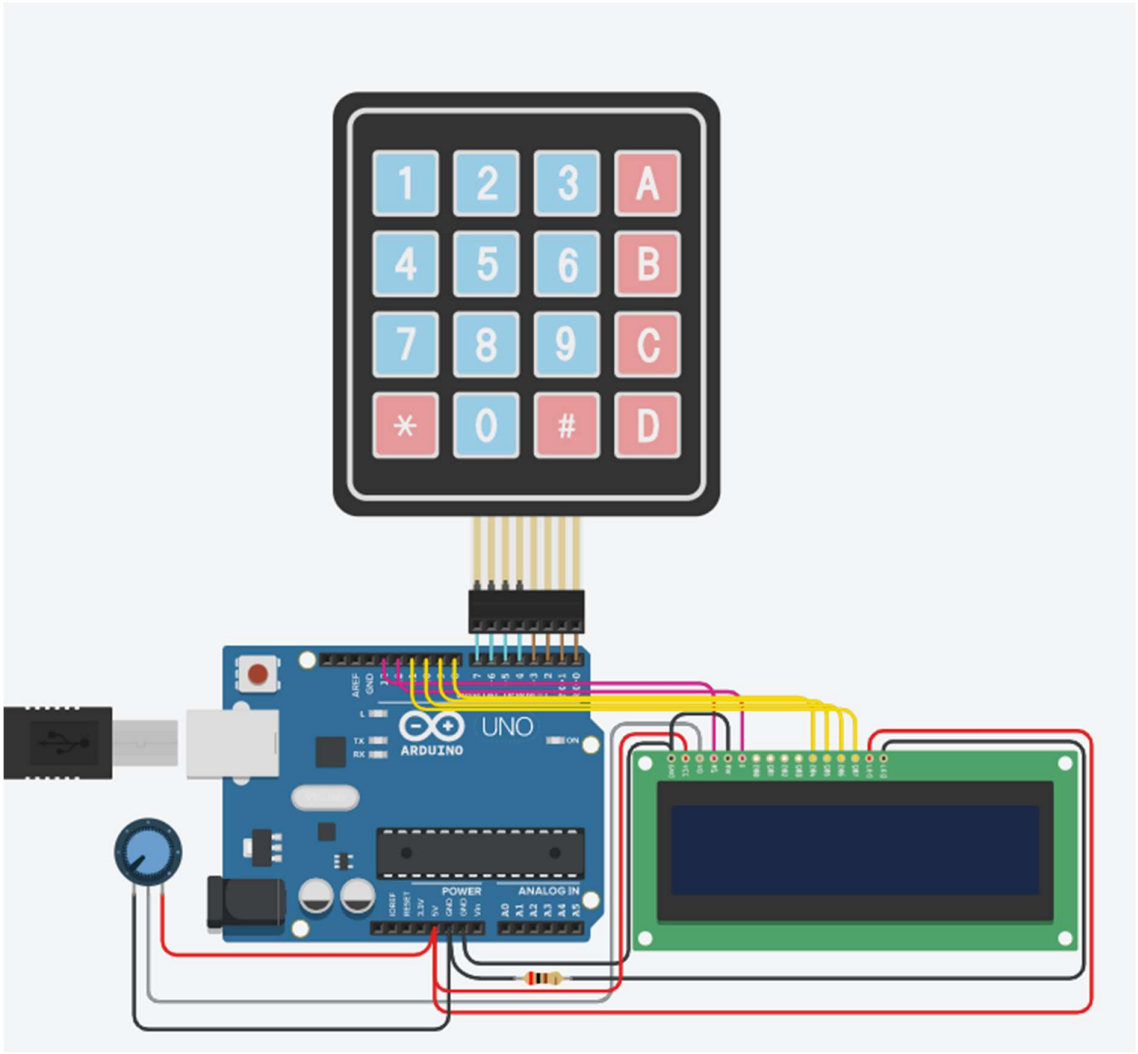
Project 2: Build a simple calculator with LCD display

Components:

Quantity	Component
1	Arduino Uno R3
1	LCD 16 x 2
1	100 Ω Potentiometer
1	0.2 kΩ Resistor
1	Keypad 4x4

Circuit Diagram:



Program:

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

LiquidCrystal lcd(13, 12, 8, 9, 10, 11);

double num1,num2 ;
double total;
char operation,button;

const byte ROWS = 4;
const byte COLS = 4;

char keys[ROWS][COLS] = {
  {'1','2','3','+'},
  {'4','5','6','-'},
  {'7','8','9','*'},
  {'C','0','=','/'}
};
byte rowPins[ROWS] = {7,6,5,4};
byte colPins[COLS] = {3,2,1,0};

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

void domath()
{
  switch(operation)
  {
    case '+':
      total = num1+num2;
```

```
      break;
    case '-':
      total = num1-num2;
      break;
    case '/':
      total = num1/num2;
      break;
    case '*':
      total = num1*num2;
      break;
  }

  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print(num1);
  lcd.print(' ');
  lcd.print(operation);
  lcd.print(' ');
  lcd.print(num2);
  lcd.setCursor(0,1);
  lcd.print("Ans = ");
  lcd.setCursor(6,1);
  lcd.print(total);
}

void setup() {
  lcd.begin(16,2);
  lcd.setCursor(0,0);
  lcd.print("Welcome");
  delay(1000);
```

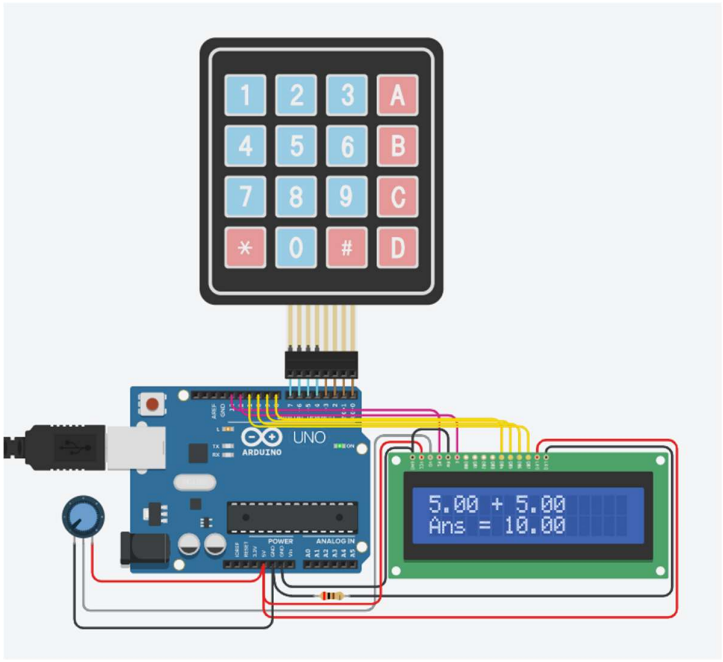
```
  lcd.setCursor(0,1);
  lcd.print("Initiating");
  delay(500);
  lcd.print(".");
  delay(500);
  lcd.print(".");
  delay(500);
  lcd.print(".");
  delay(1000);
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("Calculator");
  delay(500);
  lcd.setCursor(0,1);
  lcd.print("Initiatied");
  delay(3000);
  lcd.clear();
  lcd.begin(16, 2);
  lcd.clear();
  lcd.setCursor(0, 0);
}

void loop()
{
  while(1)
  {
    button = kpd.getKey();
    if (button >='0' && button <='9')
    {
      lcd.clear();
```

```
    num1 = num1*10 + (button -'0');
    lcd.setCursor(0,0);
    lcd.print(num1);
   }

   if (num1 !=0 && (button=='+' || button=='-' || button=='*' || button=='/'))
   {
    operation = button;
    lcd.setCursor(0,1);
    lcd.print(operation);
    break;
   }
}

while(1)
{
  button = kpd.getKey();
  if (button >='0' && button <='9')
  {
    num2 = num2*10 + (button -'0');
    lcd.setCursor(1,1);
    lcd.print(' ');
    lcd.print(num2);
  }

  if (button == '=' && num2 !=0)
  {
    domath();
    break;
  }
```

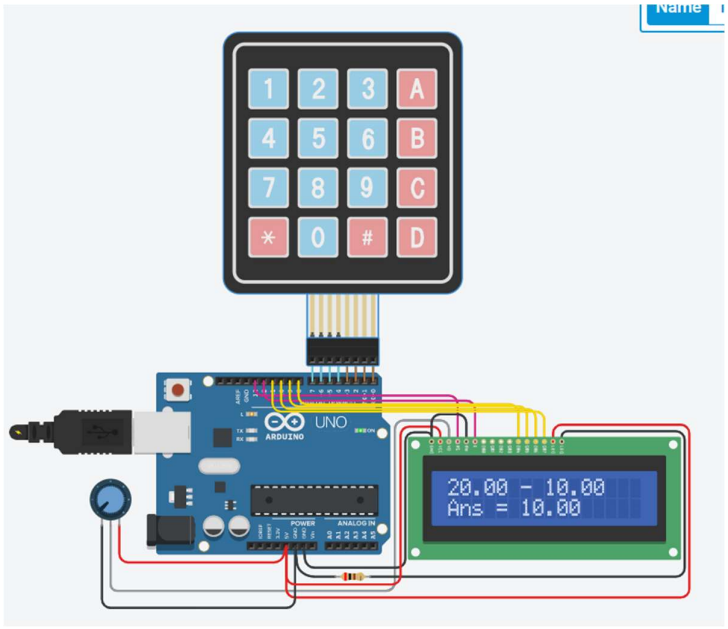
```
  }

  while(1)
  {
    button = kpd.getKey();;
    if (button =='C')
    {
      lcd.clear();
      lcd.setCursor(0,0);
      num1=0;
      num2=0;
      total=0;
      operation=0;
      break;
    }
  }
}
```

Output:

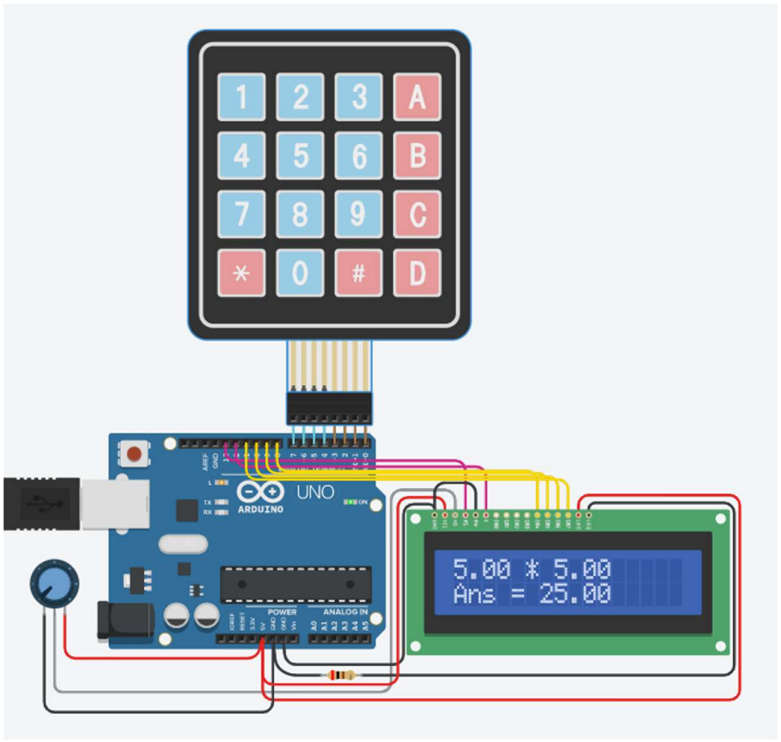
Addition



Subtraction



Multiplication



Division