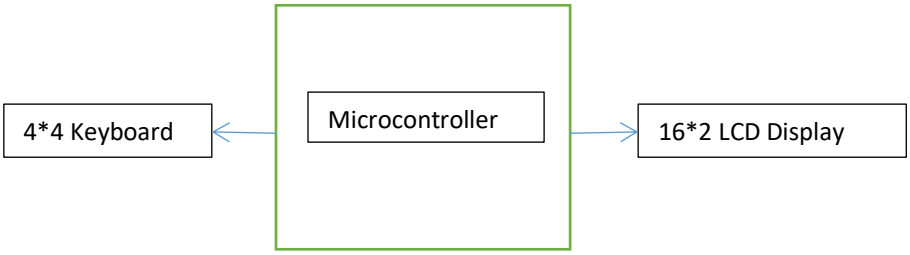
2. Arduino Calculator using 4*4 Keyboard

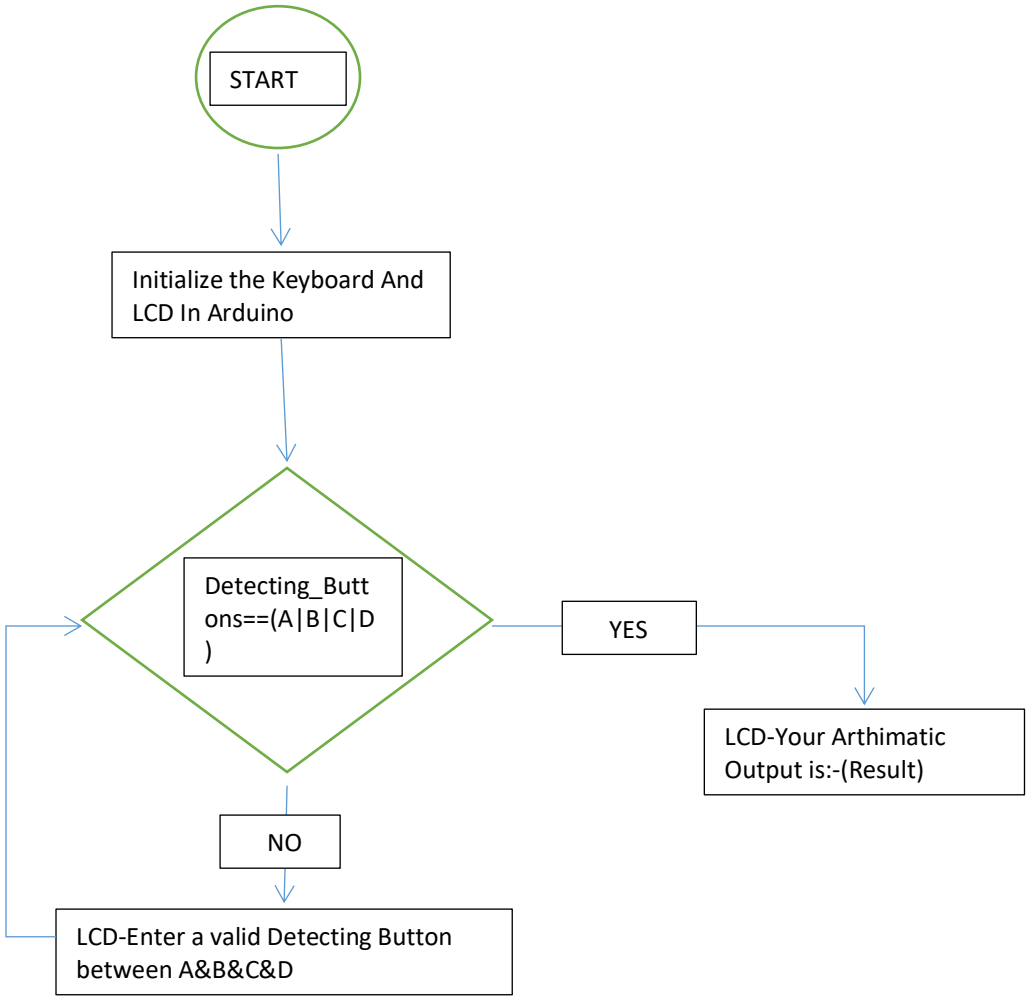
1. Block Diagram



2. Table

s.no.	Discription	Name	Type	Data Direction	Specification	Remarks
1.	lcd	16*2 LCD Display	output	DO	5VDC	
2.	Keypad	4*4 Keyboard	Input	DI	NA	

3. Flow Chart



4. C Code

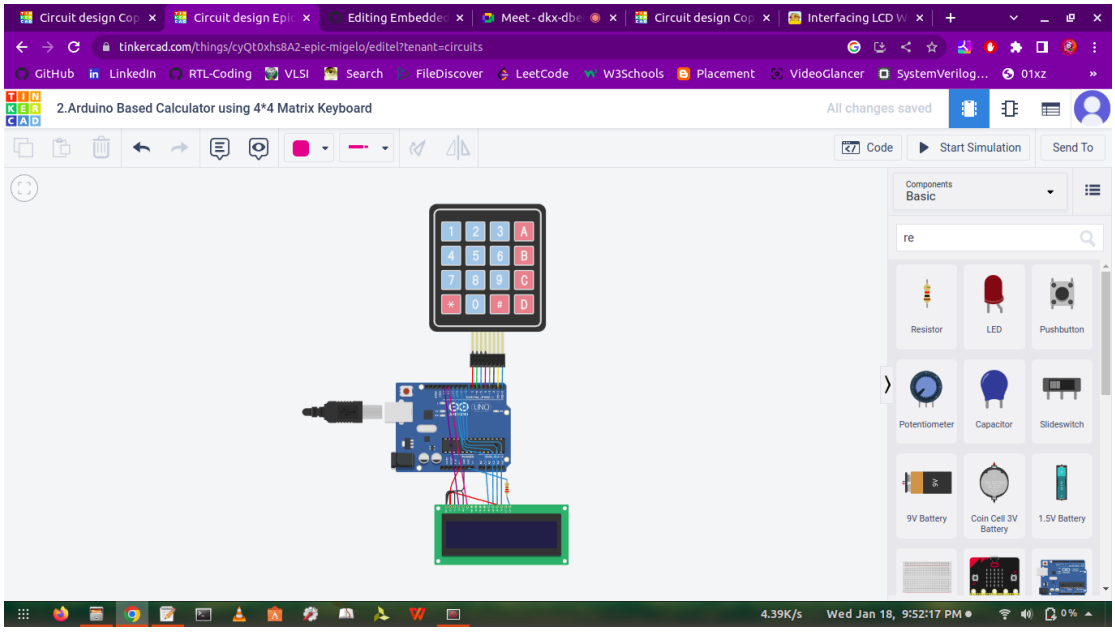
```
#include <Keypad.h>
#include <LiquidCrystal.h>

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

long Num1 = 0;
long Num2 = 0;
double Result = 0;

char Key;
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}; //connect to the row pinouts of the keypad
byte colPins[COLS] = {3,2,1,0}; //connect to the column pinouts of the keypad

//initialize an instance of class NewKeypad
Keypad myKeypad = Keypad( makeKeymap(keys), rowPins, colPins, ROWS,
COLS);

void setup()
{
lcd.begin(16, 2);// start lcd
lcd.setCursor(0,0);// in lcd Setcursor point at 0th column and 0th row
lcd.print("Calculator By");
lcd.setCursor(0,1);//in lcd Setcursor point at 0th column and 1th row
lcd.print("O.V.Krishnaiah");
delay(4000);//Wait the information until 4 milli seconds
lcd.clear();//clear the lcd Screen
lcd.setCursor(0, 0);////in lcd Setcursor point at 0th column and 0th row
}


void loop()
{

  Key = myKeypad.getKey();//getKey() instance method to Store the Pressed
Key
  switch(Key)
  {
  case '0' ... '9': // This keeps collecting the first value until a operator is
pressed "+-*/"
    lcd.setCursor(0,0);
    Num1 = Num1 * 10 + (Key - '0');
    lcd.print(Num1);
    break;

  case '+':
```

```
  Num1 = (Result != 0 ? Result : Num1);
  lcd.setCursor(0,1);
  lcd.print("+");
  Num2 = Number2(); // get the collected the second number
  Result = Num1 + Num2;
  lcd.setCursor(0,3);
  lcd.print(Result);
  Num1 = 0, Num2 = 0; // reset values back to zero for next use
  break;

 case '-':
  Num1 = (Result != 0 ? Result : Num1);
  lcd.setCursor(0,1);
  lcd.print("-");
  Num2 = Number2(); // get the collected the second number
  Result = Num1 - Num2;
  lcd.setCursor(0,3);
  lcd.print(Result);
  Num1 = 0, Num2 = 0; // reset values back to zero for next use
  break;

 case '*':
  Num1 = (Result != 0 ? Result : Num1);
  lcd.setCursor(0,1);
  lcd.print("*");
  Num2 = Number2(); // get the collected the second number
  Result = Num1 * Num2;
  lcd.setCursor(0,3);
  lcd.print(Result);
  Num1 = 0, Num2 = 0; // reset values back to zero for next use
  break;

 case '/':
  Num1 = (Result != 0 ? Result : Num1);
  lcd.setCursor(0,1);
  lcd.print("/");
  Num2 = Number2(); // get the collected the second number
  Result = Num1 / Num2;
  lcd.setCursor(0,3);
  lcd.print(Result);
  Num1 = 0, Num2 = 0; // reset values back to zero for next use
  break;
```

```
   Num2 == 0 ? lcd.print("Invalid Number") : Result = (float)Num1 /
(float)Num2;

   lcd.print(Result);
   Num1 = 0, Num2 = 0;
   break;

  case 'C':
   Result = 0;//Cancle The Calculation
   lcd.clear();
   break;
  }
}

long Number2()
{
  while( 1 )
  {
   Key = myKeypad.getKey();
   if(Key >= '0' && Key <= '9')
   {
     Num2 = Num2* 10 + (Key - '0');
     lcd.setCursor(0,2);
     lcd.print(Num2);
   }

   if(Key == '=') break;  //return Num2;
  }
 return Num2;
}
```

5. Circuit and Simulation



Link:-https://www.tinkercad.com/things/cyQt0xhs8A2-2arduino-based-calculator-using-44-matrix-keyboard/editel