1. **Arduino Calculator using 4\*4 Keyboard**
2. **Block Diagram**

4\*4 Keyboard

16\*2 LCD Display

Microcontroller

1. **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 |  |

1. **Flow Chart**

START

Initialize the Keyboard And LCD In Arduino

Detecting\_Buttons==(A|B|C|D)

YES

LCD-Your Arthimatic Output is:-(Result)

NO

LCD-Enter a valid Detecting Button between A&B&C&D

1. **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);

}

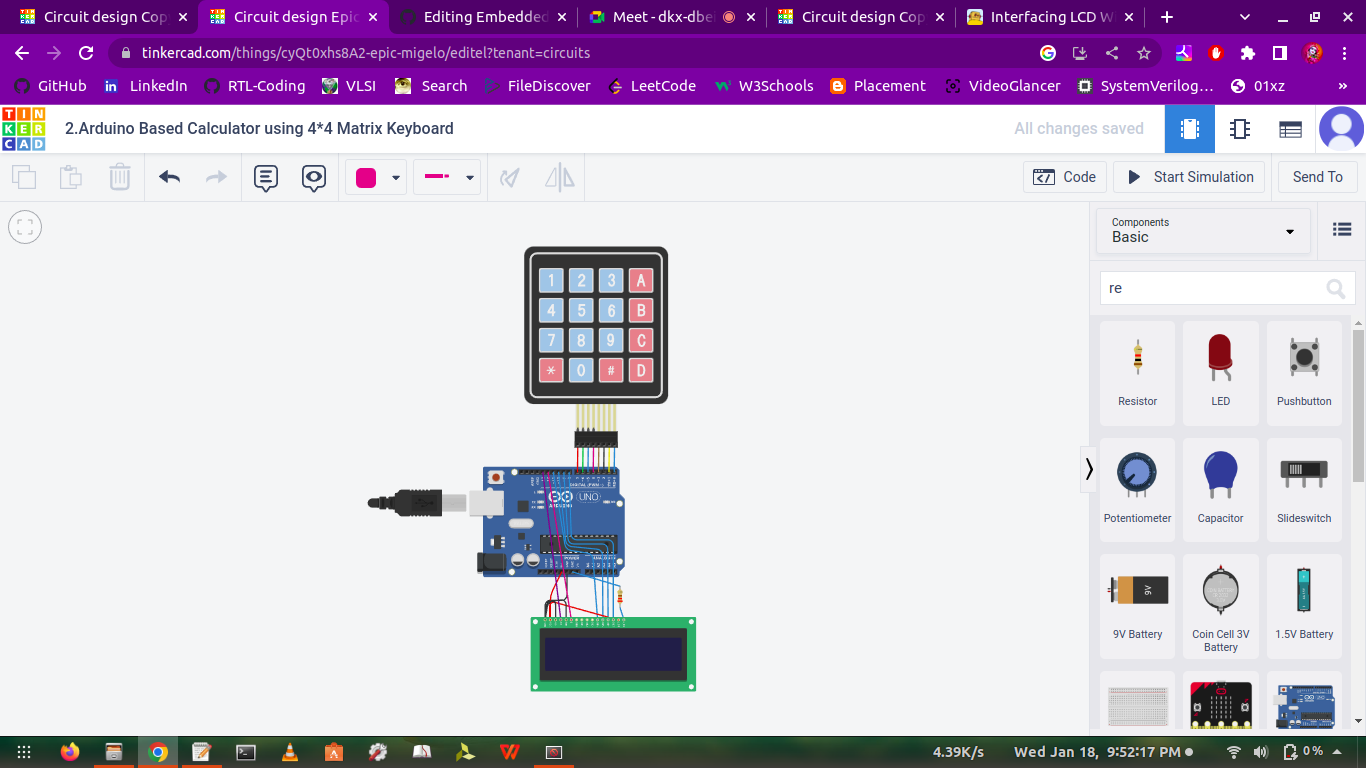
if(Key == '=') break; //return Num2;

}

return Num2;

}

1. **Circuit and Simulation**

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