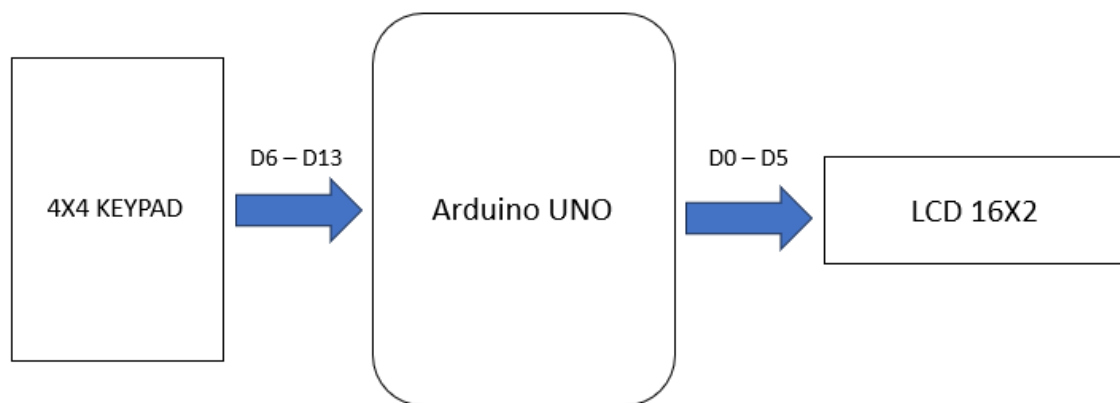


Arduino Calculator Using 4x4 keypad

Description:

An Arduino calculator is a device that performs basic arithmetic operations such as addition, subtraction, multiplication and division using a 4X4 keypad with the help of an Arduino Uno microcontroller board and an LCD display to display the input numerical value and the respective result to the user. The Arduino board is programmed such that it can access the input from the user and display the output on LCD display.

Block Diagram:



Input and Output:

Sl.No	Description	Name	Type	Data Direction	Spectification	Remarks
1	4X4 KEYPAD(COLUMNS)	1	INP	DI	Digital	Active High
2	4X4 KEYPAD(COLUMNS)	2	INP	DI	Digital	Active High
3	4X4 KEYPAD(COLUMNS)	3	INP	DI	Digital	Active High
4	4X4 KEYPAD(COLUMNS)	4	INP	DI	Digital	Active High
5	4X4 KEYPAD(ROW)	A	INP	DI	Digital	Active High
6	4X4 KEYPAD(ROW)	B	INP	DI	Digital	Active High

7	4X4 KEYPAD(ROW)	C	INP	DI	Digital	Active High
8	4X4 KEYPAD(ROW)	D	INP	DI	Digital	Active High
9	LCD RST	RS	OUT	DO	Digital	Active High
10	LCD EN	EN	OUT	DO	Digital	Active High
11	LCD DATA PIN	D4	OUT	DO	Digital	Active High
12	LCD DATA PIN	D5	OUT	DO	Digital	Active High
13	LCD DATA PIN	D6	OUT	DO	Digital	Active High
14	LCD DATA PIN	D7	OUT	DO	Digital	Active High

Source Code:

```
#include <Keypad.h>

#include <LiquidCrystal.h>

LiquidCrystal lcd(0, 1, 2, 3, 4, 5);

const byte ROWS = 4; //four rows

const byte COLS = 4; //four columns

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

byte rowPins[ROWS] = {13, 12, 11, 10};

byte colPins[COLS] = {9, 8, 7, 6};

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

int num1 = 0;

int num2 = 0;

char operation = '+';

int result = 0;

bool inputNum2 = false;

void setup() {
  lcd.begin(16, 2);
```

```

    lcd.print("Calculator");

    delay(500);

    lcd.clear();

    lcd.print("Num1:");
}

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

    if (key != NO_KEY) {
        if (key >= '0' && key <= '9') {
            if (!inputNum2) {
                num1 = num1 * 10 + (key - '0');

                lcd.setCursor(6, 0);

                lcd.print(num1);
            } else {
                num2 = num2 * 10 + (key - '0');

                lcd.setCursor(6, 1);

                lcd.print(num2);
            }
        } else if (key == '+' || key == '-' ||
key == '*' || key == '/') {
            operation = key;

            inputNum2 = true;

            lcd.setCursor(0, 1);

            lcd.print("Num2:");
        } else if (key == '=') {
            calculateResult();

            lcd.setCursor(0, 1);

            lcd.print("Result: ");

            lcd.print(result);
        } else if (key == 'C') {
            clearCalculator();

```

```

    }
}
}
void calculateResult() {
    switch (operation) {
        case '+':
            result = num1 + num2;
            break;
        case '-':
            result = num1 - num2;
            break;
        case '*':
            result = num1 * num2;
            break;
        case '/':
            if (num2 != 0) {
                result = num1 / num2;
            } else {
                lcd.setCursor(0, 1);
                lcd.print("Error: Div by 0");
                delay(2000);
                clearCalculator();
                return;
            }
            break;
    }
    num1 = result;
    num2 = 0;
    inputNum2 = false;
}

```

```

void clearCalculator() {

    num1 = 0;

    num2 = 0;

    operation = '+';

    result = 0;

    inputNum2 = false;

    lcd.clear();

    lcd.print("Num1:");

    lcd.setCursor(0, 1);

    lcd.print("    ");

}

```

Schematic:

