Assignment-6

(Dheeraj Tiwari)

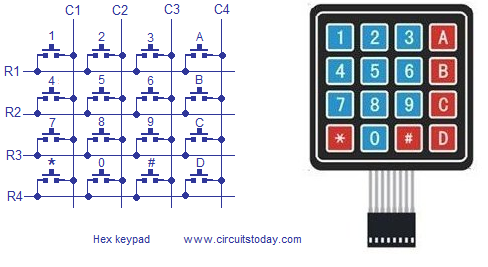
Que 1: Explain the features of Hex Keypad?

Ans: Features of Hex Keypad :

* Maximum Voltage across EACH SEGMENT or BUTTON : 24V
* Maximum Current through  EACH SEGMENT or BUTTON : 30mA
* Maximum operating temperature: 0°C to + 50°C
* Ultra-thin design
* Adhesive backing
* Easy interface
* Long life.

Que 4 : Explain the working of Hex keypad?

Ans : Hex key pad is simply an arrangement 0f 16 push button switches in a 4X4 matrix form. Typically a hex keypad will have keys for number 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and letters A, B, C, D, \*, #. The hex keypad will have 8 connection wires namely R1, R2, R3, R4 and C1, C2, C3, C4 representing the rows and columns respectively. The schematic diagram and photo of a typical hex keypad is shown in the figure below.



The program identifies the pressed key by a method called column scanning. In this method a particular row is kept low and other rows are held high. The the logic status of each column line is scanned. If a particular column is found low, then that means the key that comes in between that column and row is short(pressed). Then the program registers that key being pressed. Then the same procedure is applied for the subsequent rows and the entire process is repeated. For example if row 1 is kept low and column 1 is found low during scanning, then that means key”1″ is pressed. Full circuit diagram of interfacing hex keypad is shown below.

Que 5: Perform an experiment to implement a calculator using Hex keypad when user press.

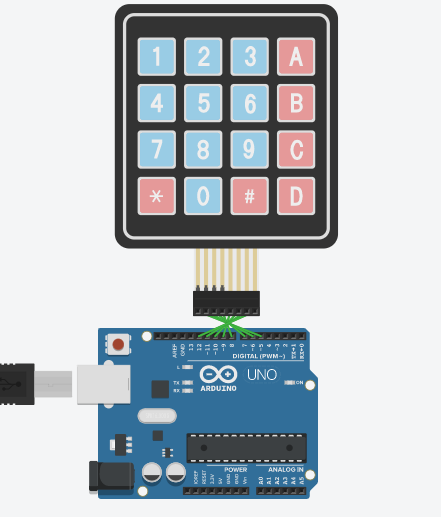
a. A key-Addition

b. B key-Subtraction

c. C key-Multiplication

d. D key-Division

Ans:



#include<Keypad.h>

const byte rows=4;

const byte cols=4;

int a=13;

int b=4;

char hexkeys[rows][cols]={

{'1','2','3','A'},

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

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

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

};

byte rowPins[rows]={5,6,7,8};

byte colPins[cols]={9,10,11,12};

Keypad

customKeypad=Keypad(makeKeymap(hexkeys),rowPins,colPins,rows,cols);

void setup(){

Serial.begin(9600);

}

void loop(){

char customKey=customKeypad.getKey();

if(customKey=='A'){

int sum=a+b;

Serial.print("SUM:");

Serial.println(sum);

}else if(customKey=='B'){

int sub=a-b;

Serial.print("SUB:");

Serial.println(sub);

}else if(customKey=='C'){

int mul=a\*b;

Serial.print("MUL:");

Serial.println(mul);

}else if(customKey=='D'){

float div=a/b;

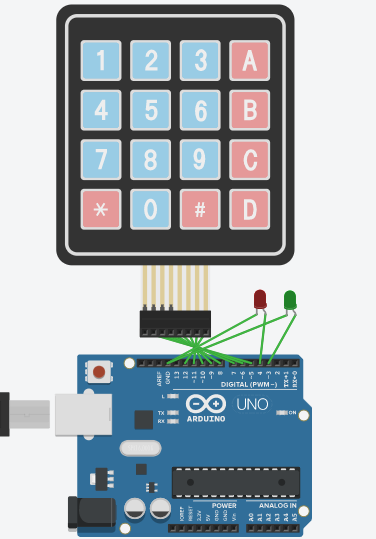
Serial.print("DIV:");

Serial.println(div);

}else{};

}

Que 3: Perform an experiment to glow red led when user press a wrong character through hex keypad.

Ans: 

#include<Keypad.h>

const byte rows=4;

const byte cols=4;

String password="135A";

String temp="";

int led1=3;

int led2=4;

char hexkeys[rows][cols]={

{'1','2','3','A'},

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

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

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

};

byte rowPins[rows]={5,6,7,8};

byte colPins[cols]={9,10,11,12};

Keypad

customKeypad=Keypad(makeKeymap(hexkeys),rowPins,colPins,rows,cols);

void setup(){

Serial.begin(9600);

pinMode(led1,OUTPUT);

pinMode(led2,OUTPUT);

}

void loop(){

char key=customKeypad.getKey();

if(key){

Serial.println(key);

if(key=='0'|| key=='1' || key=='2' || key=='3'|| key=='4'||

key=='5'||

key=='6' || key=='7' || key=='8'|| key=='9' ||

key=='A'||key=='B' || key=='C'|| key=='D')

{

temp=temp+key;

}

if(key=='\*')

{

if(temp==password){

digitalWrite(led1,HIGH);

Serial.println("right password");

}

else{

digitalWrite(led2,HIGH);

Serial.println("wrong password");

}

}

if(key=='#')

{

temp="";

digitalWrite(led1,LOW);

digitalWrite(led2,LOW);}}}