#include <LiquidCrystal.h>

**سوال اول**

const int rs = 13, en = 12, d4 = 8, d5 = 9, d6 = 10, d7 = 11;

//define a lcd

LiquidCrystal lcd(rs, en, d4, d5, d6, d7);

byte col = 0;

byte row = 0;

void setup() {

//begin lcd with size of 16x2

lcd.begin(16, 2);

//clear lcd screen

lcd.clear();

}

void loop() {

lcd.clear();

//define where the cursor should start

lcd.setCursor(col, row);

//print a text

lcd.print("Rojina kashefi");

//increase in line

col++;

//if we have iterated all coloums

if (col == 16)

{

//make coloum 0

col = 0;

//switch between rows

//if row 0 then row 1

//if row 1 then row 0

row = 1 - row;

}

delay(100);}

#include <LiquidCrystal.h>

**سوال دوم**

#include <Keypad.h>

//define row sizes keypad

const byte ROWS = 4;

//define col sizes of keypad

const byte COLS = 4;

//define keypad values

//we only use # for clearing

//and numbers for writing passwords

//and \* to check if password is correct or not

//we dont do operations

char keys[ROWS][COLS] = {

{'7', '8', '9', '\*'},

{'4', '5', '6', '\*'},

{'1', '2', '3', '\*'},

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

};

//define pins of rows

byte rowPins[ROWS] = {31, 33, 35, 37};

//define pins of cols

byte colPins[COLS] = {23, 25, 27, 29};

//define lcd pins

const int rs = 13, en = 12, d4 = 8, d5 = 9, d6 = 10, d7 = 11;

//creating keypad

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

//creating an lcd

LiquidCrystal lcd(rs, en, d4, d5, d6, d7);

//show which col we are

byte col = 0;

//password we want to check its value we wirte on lcd

String password;

void setup() {

//start lcd work with size of 16x2

lcd.begin(16, 2);

//clear lcd page

lcd.clear();

}

void loop() {

//we will set the cursor wherever our col

//increase col,character by character

lcd.setCursor(col, 0);

//get key value which is pressed

char key = keypad.getKey();

if (key) {

//use to clear page and set password to nothing

if (key == '#') {

lcd.clear();

col = 0;

password = "";

}

//check password

else if (key == '\*')

{

//put cursor in a new line

//to print in a new line

lcd.setCursor(0, 1);

if (password == "9831118") {

lcd.print("Correct password");

password = "";

} else {

lcd.print("Wrong password");

password = "";

}

} else {

//write key on lcd

lcd.print(key);

//add each key to end of password

password += key;

//increase col

col++;

}

}

}

#include <LiquidCrystal.h>

**سوال سوم**

#include <Keypad.h>

//define how many rows and coloums our keypad has

const byte ROWS = 4;

const byte COLS = 4;

//define values of keys on matrix

char keys[ROWS][COLS] = {

{'7', '8', '9', '/'},

{'4', '5', '6', '\*'},

{'1', '2', '3', '-'},

{'o', '0', '=', '+'}

};

byte rowPins[ROWS] = {31, 33, 35, 37}; //connect to the row pinouts of the keypad

byte colPins[COLS] = {23, 25, 27, 29}; //connect to the column pinouts of the keypad

const int rs = 13, en = 12, d4 = 8, d5 = 9, d6 = 10, d7 = 11;

//make a keypad and lcd based on the pins

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

LiquidCrystal lcd(rs, en, d4, d5, d6, d7);

//for calculation we need to operation

String op1, op2;

//operand we want to calculate

char op;

boolean op\_entered = false;

//initialize lcd size

//clear lcd

//put in first place

void setup() {

lcd.begin(16, 2);

lcd.clear();

lcd.setCursor(0, 0);

}

void loop() {

char key = keypad.getKey();

if (key) {

lcd.print(key);

//use o key for clearing all operations

if (key == 'o')

{

op1 = "";

op2 = "";

op\_entered = false;

lcd.clear();

lcd.setCursor(0, 0);

}

//use for calculate operation

else if (key == '=')

{

int a = op1.toInt();

int b = op2.toInt();

//put in cursor in next row

lcd.setCursor(0, 1);

//based on operand do the calculation

switch (op)

{

case '+':

lcd.print(a + b);

break;

case '-':

lcd.print(a - b);

break;

case '\*':

lcd.print(a \* b);

break;

case '/':

lcd.print((float)a / b);

break;

}

}

//write operand + - \* /

else if (!op\_entered && (key == '+' || key == '-' || key == '\*' || key == '/'))

{

op = key;

op\_entered = true;

}

//if there is no operand enterned it means it is the first number

else if (! op\_entered)

{

op1 += key;

}

//if operand has been enterd it is the second number

else

{

op2 += key;

}

}

}

#include <LiquidCrystal.h>

**سوال چهارم**

#include <Keypad.h>

//make a lcd with pins

const int rs = 13, en = 12, d4 = 8, d5 = 9, d6 = 10, d7 = 11;

LiquidCrystal lcd(rs, en, d4, d5, d6, d7);

boolean flag = false;

char incomingByte;

int col = 0;

int row = 0;

void setup() {

//shows to speed of exchanging of data with terminal

Serial.begin(9600);

lcd.begin(16, 2);

lcd.clear();

}

void loop() {

//if it hasnt read anything make flag =true

//read the incoming byte

if (Serial.available() > 0 && !flag) {

incomingByte = Serial.read();

flag = true;

col = 0;

row = 0;

}

//clear lcd

lcd.clear();

//set the cursor place

lcd.setCursor(col, row);

//shows incoming byte

lcd.print(incomingByte);

//go between coloums if reached end go to first

col++;

if (col == 16) {

col = 0;

}

//switch between lines

row = 1 - row;

delay(300);

}