```cpp
#include <LiquidCrystal.h>

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);}
```

```cpp
#include <LiquidCrystal.h>

#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;
```

```arduino
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>
#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);
}
```

```arduino
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;

  }

 }

}
```

```cpp
#include <LiquidCrystal.h>

#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);
}
```