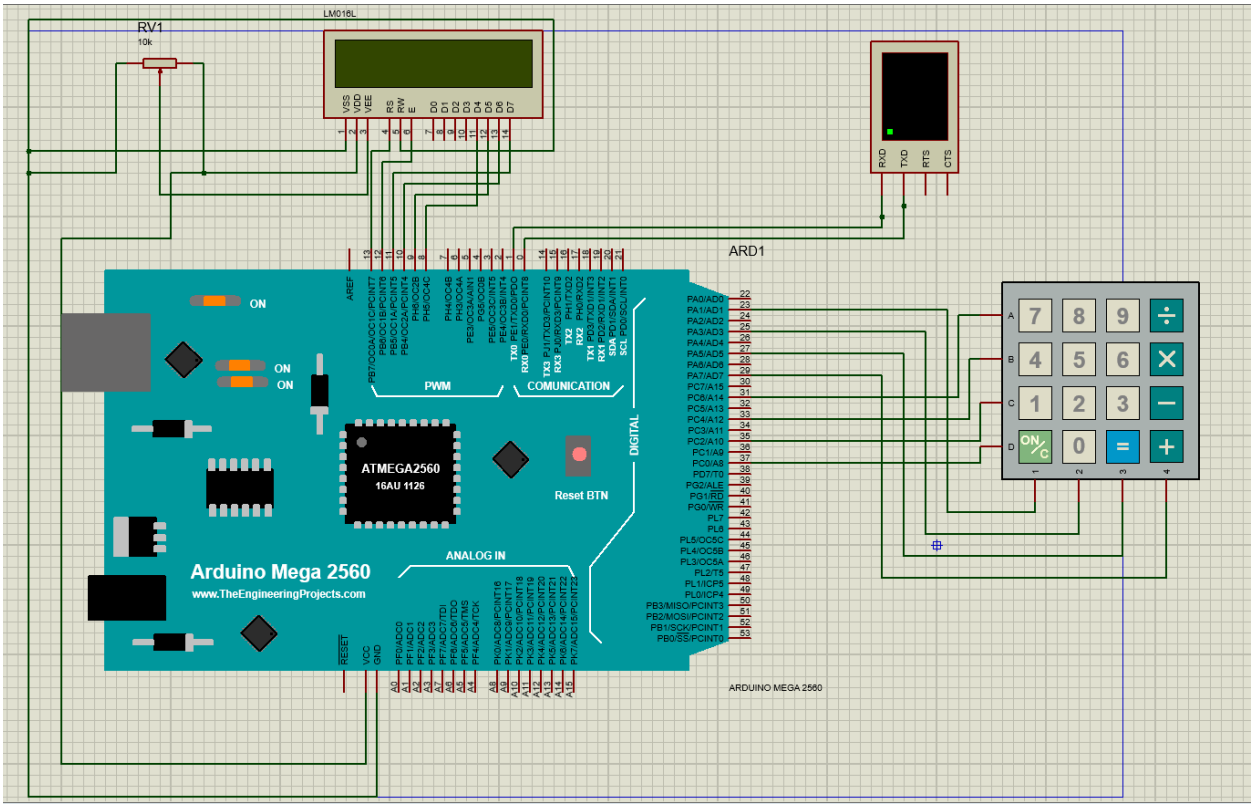
موژان میرجلیلی - 9831140



q1

```
#include <LiquidCrystal.h>

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

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

byte col = 0;
byte row = 0;

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

void loop() {
  lcd.clear();
  lcd.setCursor(col, row);
  lcd.print("Moujan <3");

  col++;
  if (col == 16)
  {
    col = 0;
    row = 1 - row;
  }
  delay(100);

}
```

q2

```
#include <LiquidCrystal.h>
#include <Keypad.h>

const byte ROWS = 4;
const byte COLS = 4;
char keys[ROWS][COLS] = {
  {'7', '8', '9', '/'},
  {'4', '5', '6', '*'},
  {'1', '2', '3', '-'},
  {'#', '0', '=', '+'}
};
byte rowPins[ROWS] = {31, 33, 35, 37};
byte colPins[COLS] = {23, 25, 27, 29};
const int rs = 13, en = 12, d4 = 8, d5 = 9, d6 = 10, d7 = 11;

Keypad keypad = Keypad( makeKeymap(keys), rowPins, colPins, ROWS, COLS );
LiquidCrystal lcd(rs, en, d4, d5, d6, d7);

byte col = 0;
String password;

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

void loop() {
  lcd.setCursor(col, 0);
  char key = keypad.getKey();
  if (key) {
    if (key == '#')
    {
      lcd.clear();
      col = 0;
      password = "";
    }
    else if (key == '*')
    {
      lcd.setCursor(0, 1);
      if (password == "9831140") {
        lcd.print("Correct password");
        password = "";
      } else {
        lcd.print("Wrong password");
        password = "";
      }
    }
    else
    {
      lcd.print(key);
      password += key;
      col++;
    }
  }
}
```

q3

```
#include <LiquidCrystal.h>
#include <Keypad.h>

const byte ROWS = 4;
const byte COLS = 4;
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;

Keypad keypad = Keypad( makeKeymap(keys), rowPins, colPins, ROWS, COLS );
LiquidCrystal lcd(rs, en, d4, d5, d6, d7);

String op1, op2;
char op;
boolean op_entered = false;

void setup() {
  lcd.begin(16, 2);
  lcd.clear();
  lcd.setCursor(0, 0);
}

void loop() {
  char key = keypad.getKey();
  if (key) {
    lcd.print(key);
    if (key == 'o')
    {
      op1 = "";
      op2 = "";
      op_entered = false;
      lcd.clear();
      lcd.setCursor(0, 0);
    }
    else if (key == '=')
    {
      int a = op1.toInt();
      int b = op2.toInt();
      lcd.setCursor(0, 1);
      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;
      }
    }
    else if (!op_entered && (key == '+' || key == '-' || key == '*' || key == '/'))
    {
      op = key;
      op_entered = true;
    }
    else if (! op_entered)
    {
      op1 += key;
    }
    else
    {
      op2 += key;
    }
  }
}
```

q4

```
#include <LiquidCrystal.h>
#include <Keypad.h>

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() {
  Serial.begin(9600);
  lcd.begin(16, 2);
  lcd.clear();
}
void loop() {
  if (Serial.available() > 0 && !flag) {
    incomingByte = Serial.read();
    flag = true;
    col = 0;
    row = 0;
  }

  lcd.clear();
  lcd.setCursor(col, row);
  lcd.print(incomingByte);
  col++;
  if (col == 16) {
    col = 0;
  }
  row = 1 - row;
  delay(300);
}
```