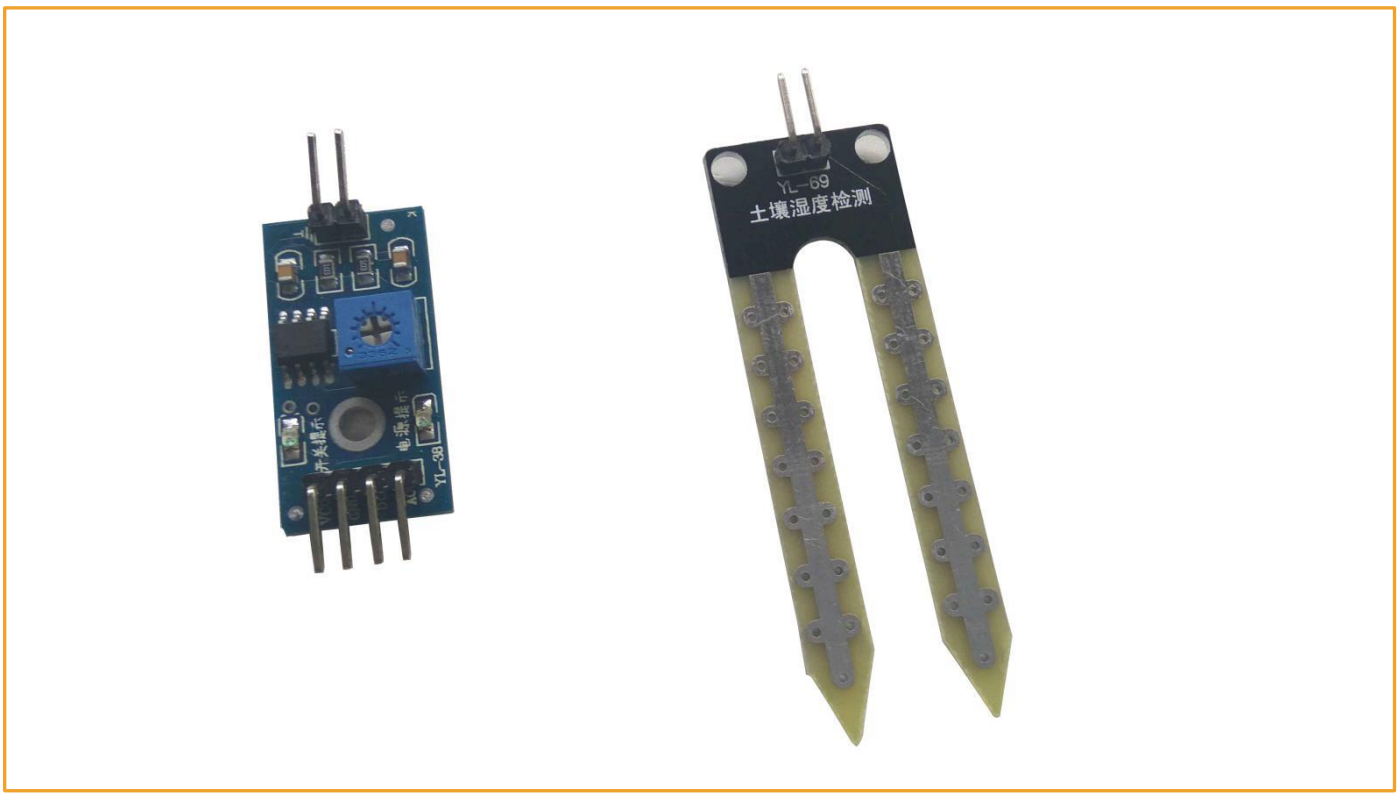
Soil Moisture Sensor module experiment

Introduction of soil Moisture Sensor module

The soil moisture sensor module has two copper strips that are sensor probes. When they are inserted into the soil, they can detect moisture. The wetter the soil, the better the conductivity, the lower the electrical resistance between them. The dry soil is less conductive, so the resistance between them is higher. It's an analog sensor, so we get the voltage by simulating the input. It is also possible to obtain high and low levels through a digital interface, usually using analog values obtained in the process we use. Since the soil moisture can be divided into several levels, it will be convenient to use when we use the soil moisture sensor to make an automatic watering system.



The soil moisture sensor module figure

1, The sensor is suitable for the soil moisture detection;

2, The blue potentiometer on the module is used to adjust soil moisture threshold, the controlled humidity is greater as adjusting clockwise, and smaller counterclockwise.

3, The digital output D0 can link directly to the microcontroller to detect the high and low level, therefore to detect soil moisture;

4, The analog output AO (0 ~ 1023) can link to AD modules, through the AD conversion, the soil moisture value can be obtained more accurately.

Pin Description

1 VCC: connect to 3.3 V-5 V
2 GND: connect to GND
3 DO: digital output interface
4 AO: Analog output interface

Experimental Principle

From the sensor above, we can see that the two copper bars are sensor probes. When they are inserted into the soil, they can detect moisture. The wetter the soil, the better the conductivity, the lower the electrical resistance between them. It's an analog sensor, so we get the voltage by simulating the input. The drier the soil, the higher the voltage because the resistance between the probes is higher.

Component List

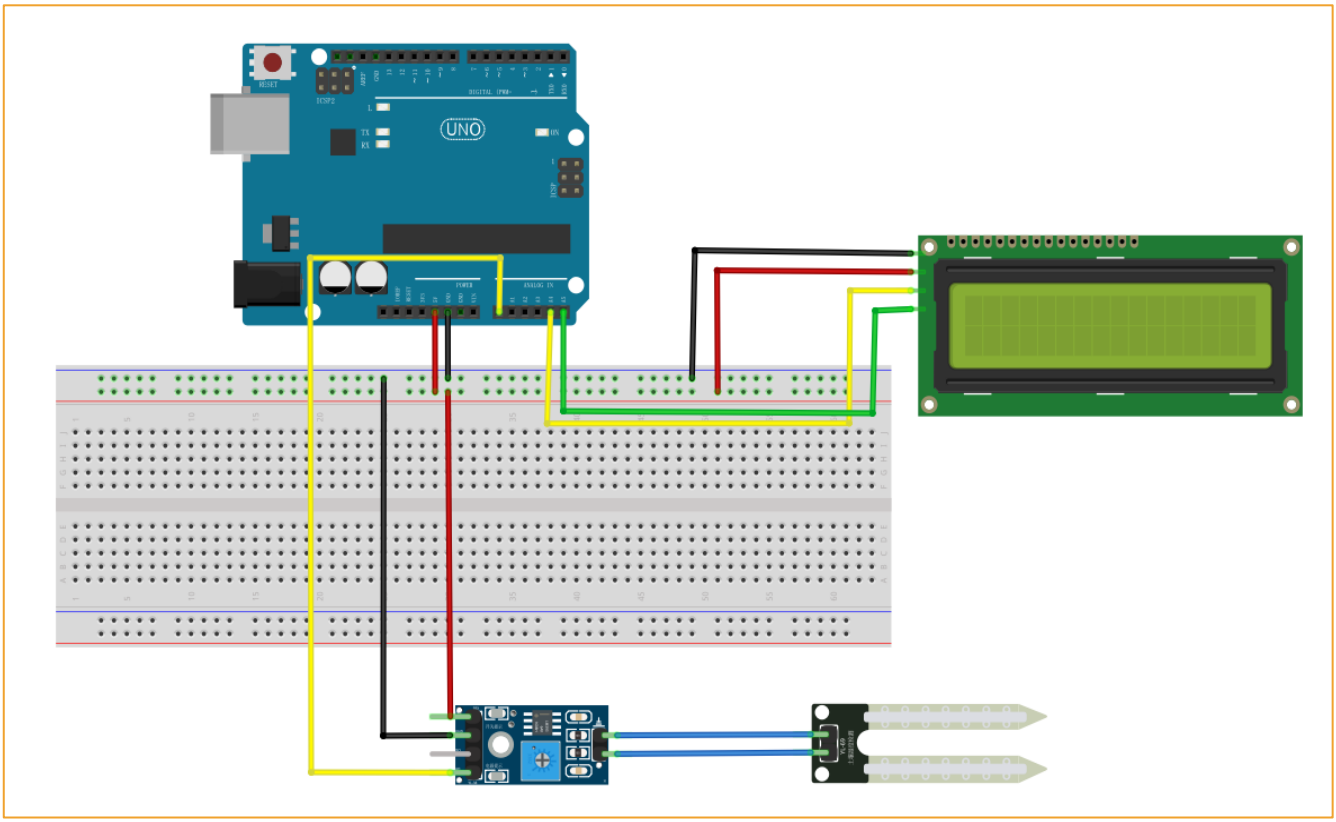
- Keywish Arduino UNO R3 Mainboard
- Breadboard
- USB cable
- LCD1602 * 1
- The soil moisture sensor * 1
- Several jumpers

Wiring of Circuit

Definition of pin of soil moisture sensor adapter plate:
VCC: connect the positive pole of power supply (3-5v)
GND: connect the power negative pole
DO: digital signal output
AO: analog signal output

LCD display	Arduino
GND	GND
VCC	5V
SDA	A4
SCL	A5
Soil Moisture Sensor	Arduino
GND	GND
VCC	5V

A0	A0

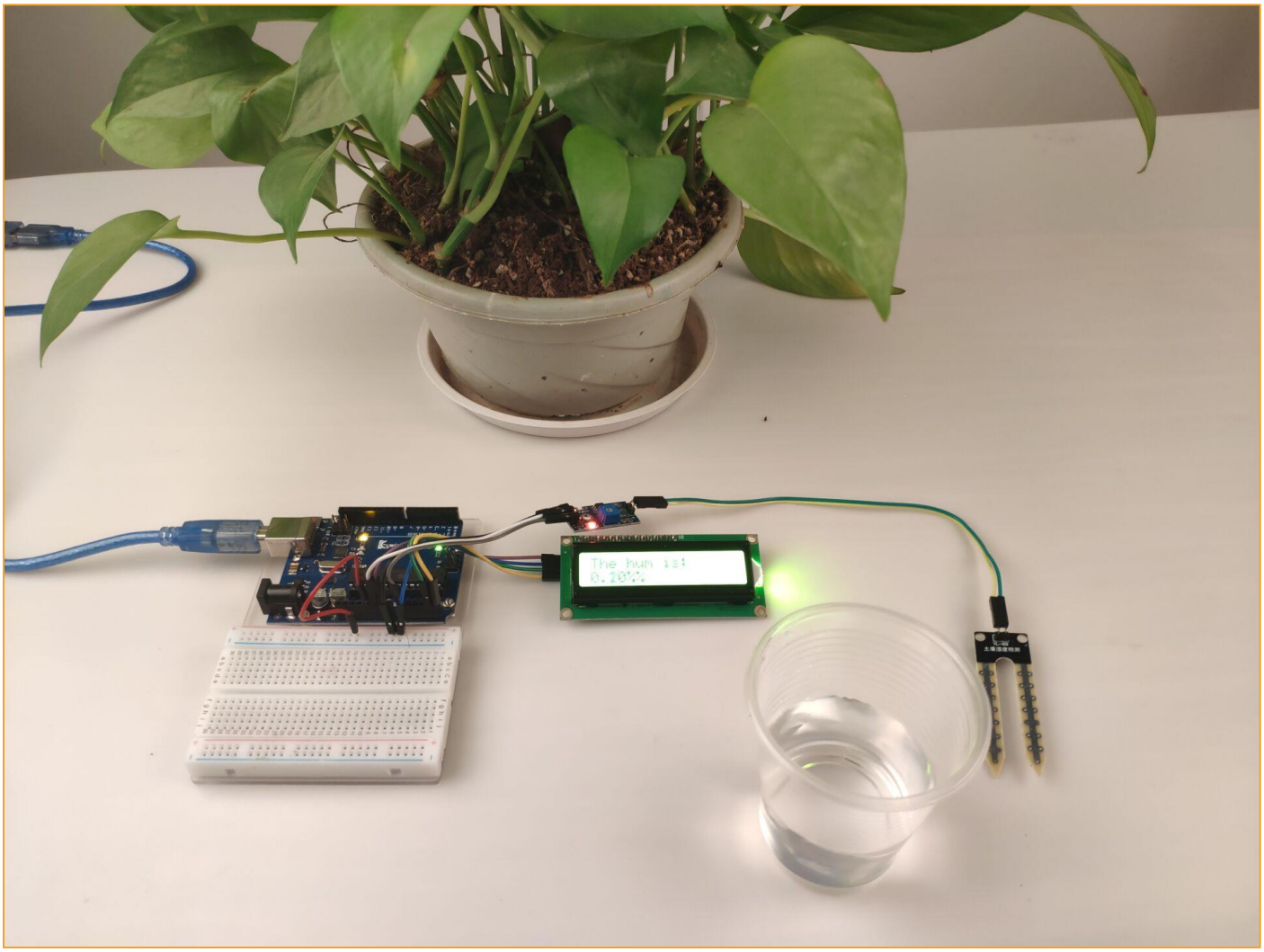


Arduino IDE CODE

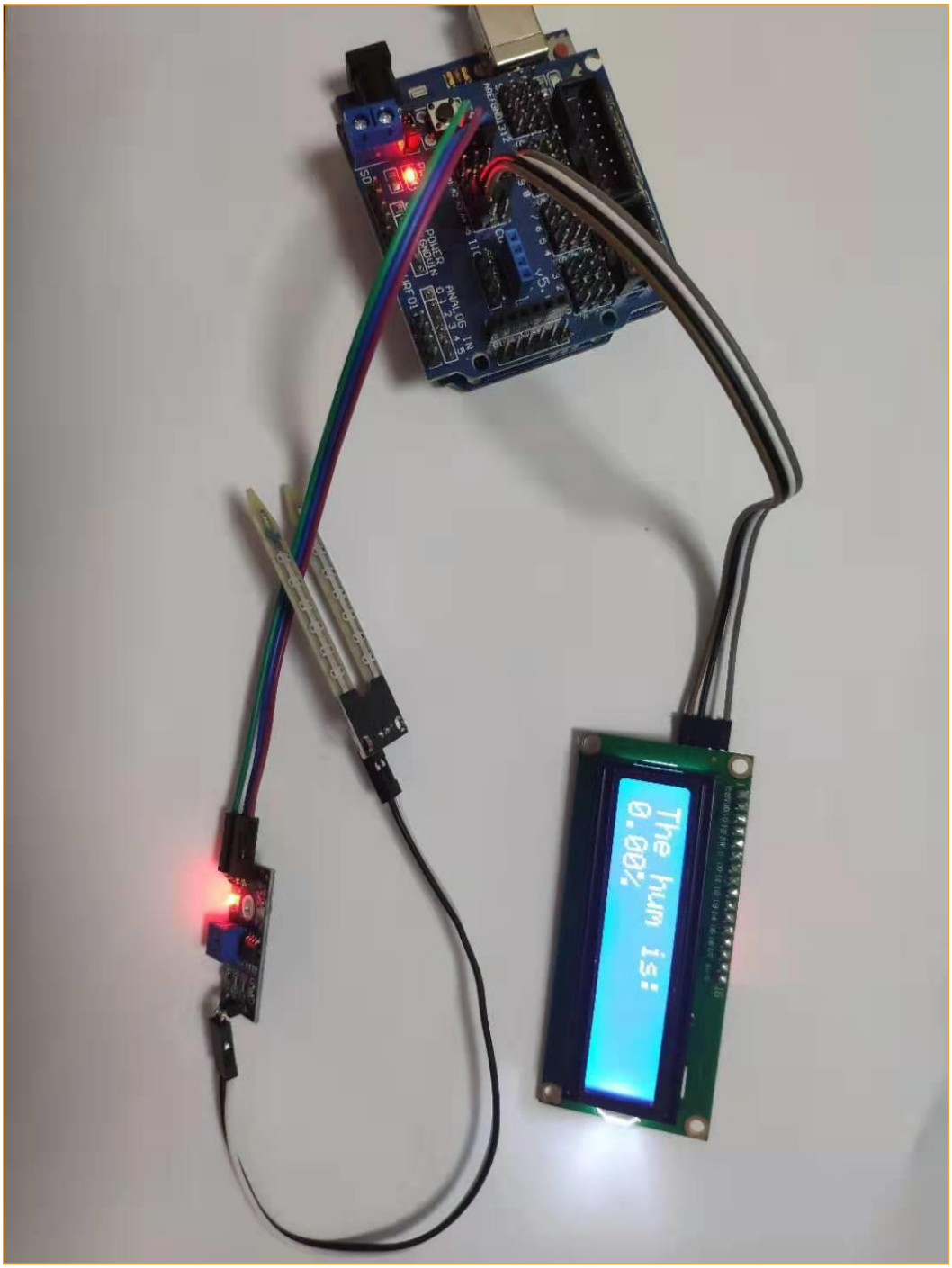
```
#include <Wire.h>
#include "LiquidCrystal_I2C.h"
int analogPin=A0;
float i=0;
float j=0;
 LiquidCrystal_I2C lcd(0x27, 16, 2);// 0x27 is the I2C bus address for an unmodified backpack
void setup()
{
  lcd.init();
  lcd.backlight();
  pinMode(analogPin, INPUT);
  Serial.begin(9600);
}

void loop() {
    float data=analogRead(analogPin);
    Serial.println(data);
    i=data/1023;
    j=(1-i)*100;
```

```
    lcd.setCursor(0, 0);
    lcd.print("The hum is: ");
    lcd.setCursor(0, 1);
    lcd.print((float)j, 2);
    lcd.print("%");
    delay(200);
}
```

Experiment Result



If you have a sensor V5.0 expansion pad in your kit, you can connect it as shown in the figure below for more convenience



MBlock graphical programming program

The main building blocks used by mBlock to write soil moisture program are:

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--Set the serial port baud rate
- 

--LCD1602 display screen initialization

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--Read the value of the simulated pin
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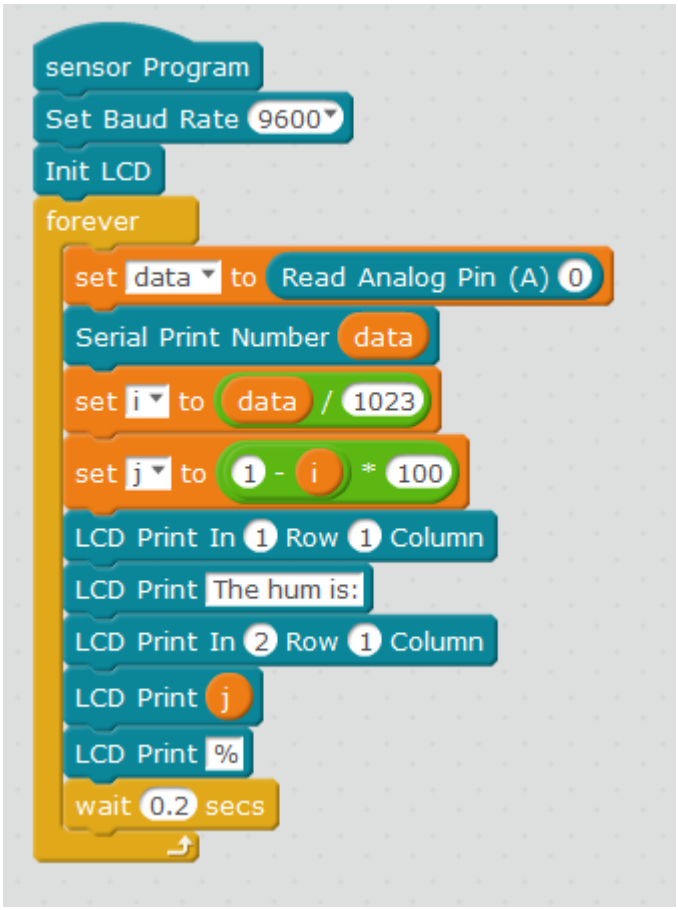
--Set the display to display content
- 

--Set display position
- 

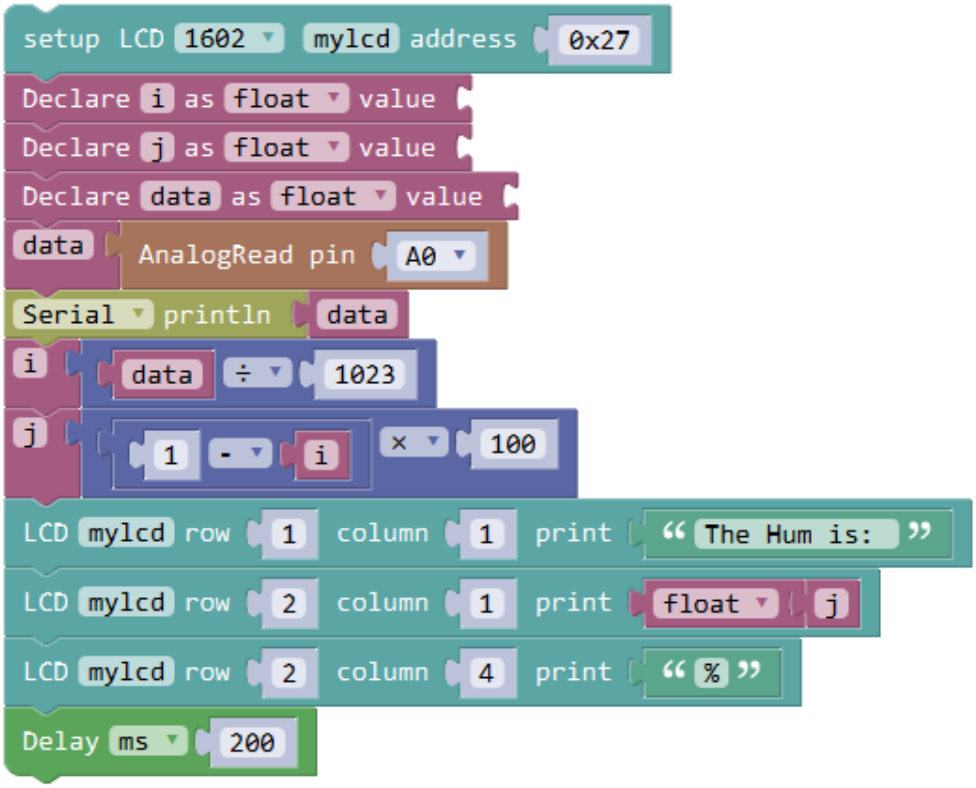
--Assign a value to the new variable

The soil moisture program prepared by mBlock is shown in the figure below:



Mixly graphical programming program

Mixly programmed the soil moisture program as shown below:


setup LCD 1602 mylcd address 0x27
Declare i as float value
Declare j as float value
Declare data as float value
data AnalogRead pin A0
Serial println data
i data ÷ 1023
j 1 - i × 100
LCD mylcd row 1 column 1 print " The Hum is: "
LCD mylcd row 2 column 1 print float j
LCD mylcd row 2 column 4 print " % "
Delay ms 200