Lesson 13 Membrane Switch Module

Introduction

In this lesson, we will go over how to how to set up a keypad on an arduino so that the Mega 2560 can read the keys being pressed by a user.

Hardware Required

- ✓ 1 * RexQualis Mega 2560
- ✓ 1 * Membrane Switch module
- ✓ 8 * M-M Jumper Wires

Principle

Membrane Switch Module（Keypads）

Membrane Switch Module（Keypads） are a great way to let users interact with your project. You can use them to navigate menus, enter passwords, and control games and robots.Pressing a button closes the switch between a column and a row trace, allowing current to flow between a column pin and a row pin.

The schematic for a 4X4 keypad shows how the rows and columns are connected:
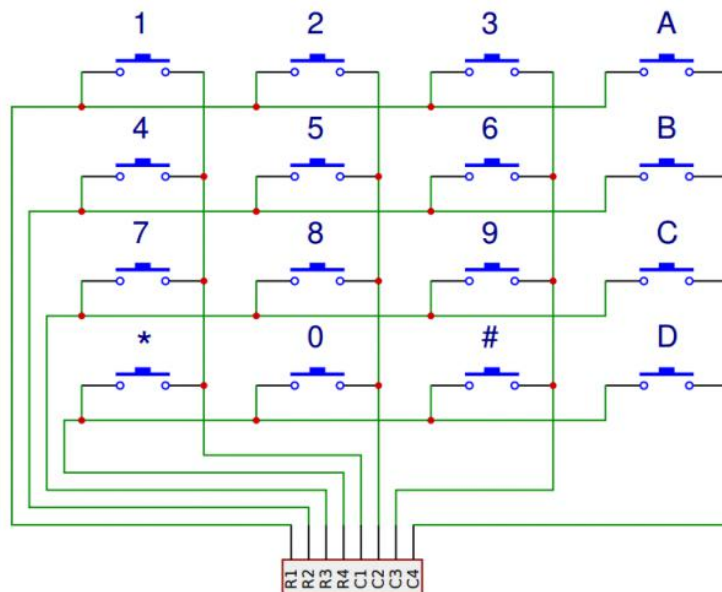
Code interpretation

const byte ROWS = 4; **//four rows**

const byte COLS = 4; **//four columns**

//define the cymbols on the buttons of the keypads

char hexaKeys[ROWS][COLS] = {

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

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

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

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

};

byte rowPins[ROWS] = {9, 8, 7, 6}; //connect to the row pinouts of the keypad

byte colPins[COLS] = {5, 4, 3, 2}; //connect to the column pinouts of the keypad

//initialize an instance of class NewKeypad

Keypad customKeypad = Keypad(makeKeymap(hexaKeys), rowPins, colPins,

```
ROWS, COLS);

void setup(){

   Serial.begin(9600);

}

void loop(){

   char customKey = customKeypad.getKey();

   if (customKey){

      Serial.println(customKey);

   }

}
```

Experimental Procedures

Step 1:Build the circui

When connecting the pins to the Mega 2560 board, we connect them to the digital output pins, D9-D2. We connect the first pin of the keypad to D9, the second pin to D8, the third pin to D7, the fourth pin to D6, the fifth pin to D5, the sixth pin to D4, the seventh pin to D3, and the eighth pin to D2.

These are the connections in a table:

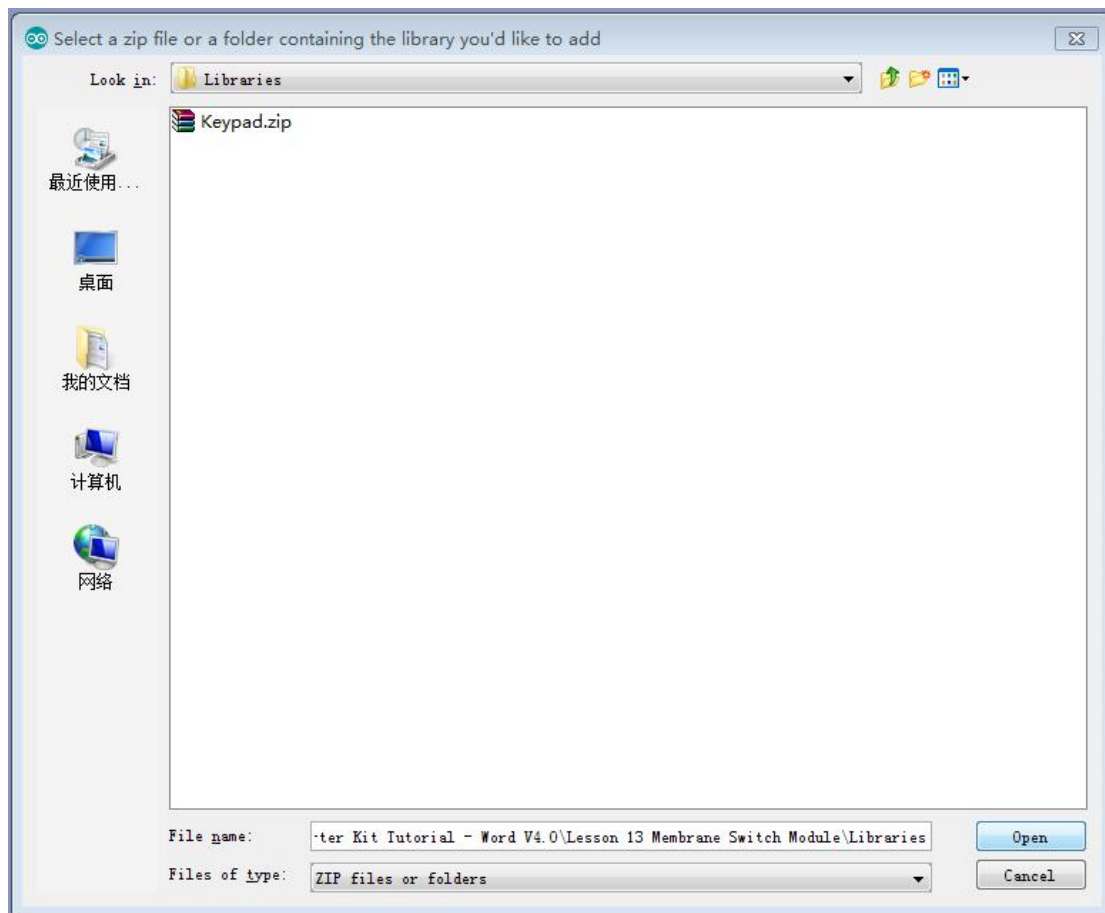| Keypad Pin	Connects to Arduino Pin
1	D9
2	D8
3	D7
4	D6
5	D5
6	D4
7	D3
8	D2
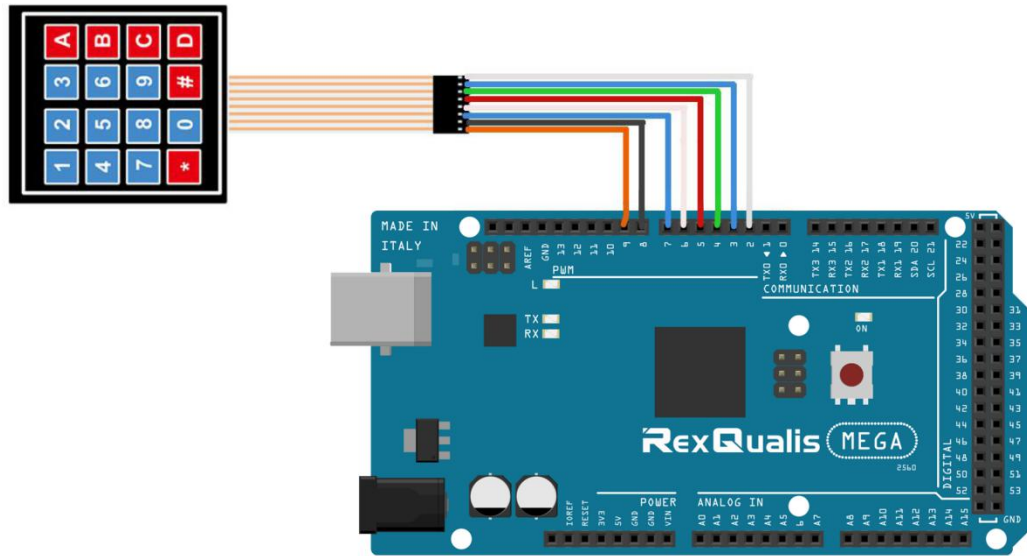
Schematic Diagram
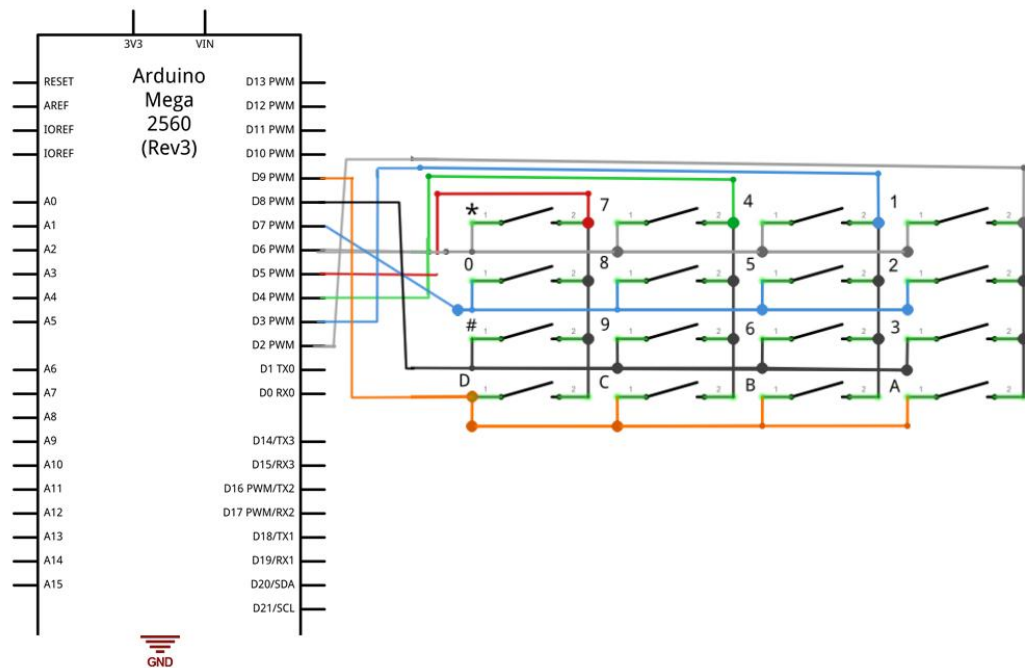
Step 2:Open the code:Membrane_Switch_Module_Code

Step 3:Attach Arduino Mega 2560 board to your computer via USB cable and check that the 'Board Type' and 'Serial Port' are set correctly.
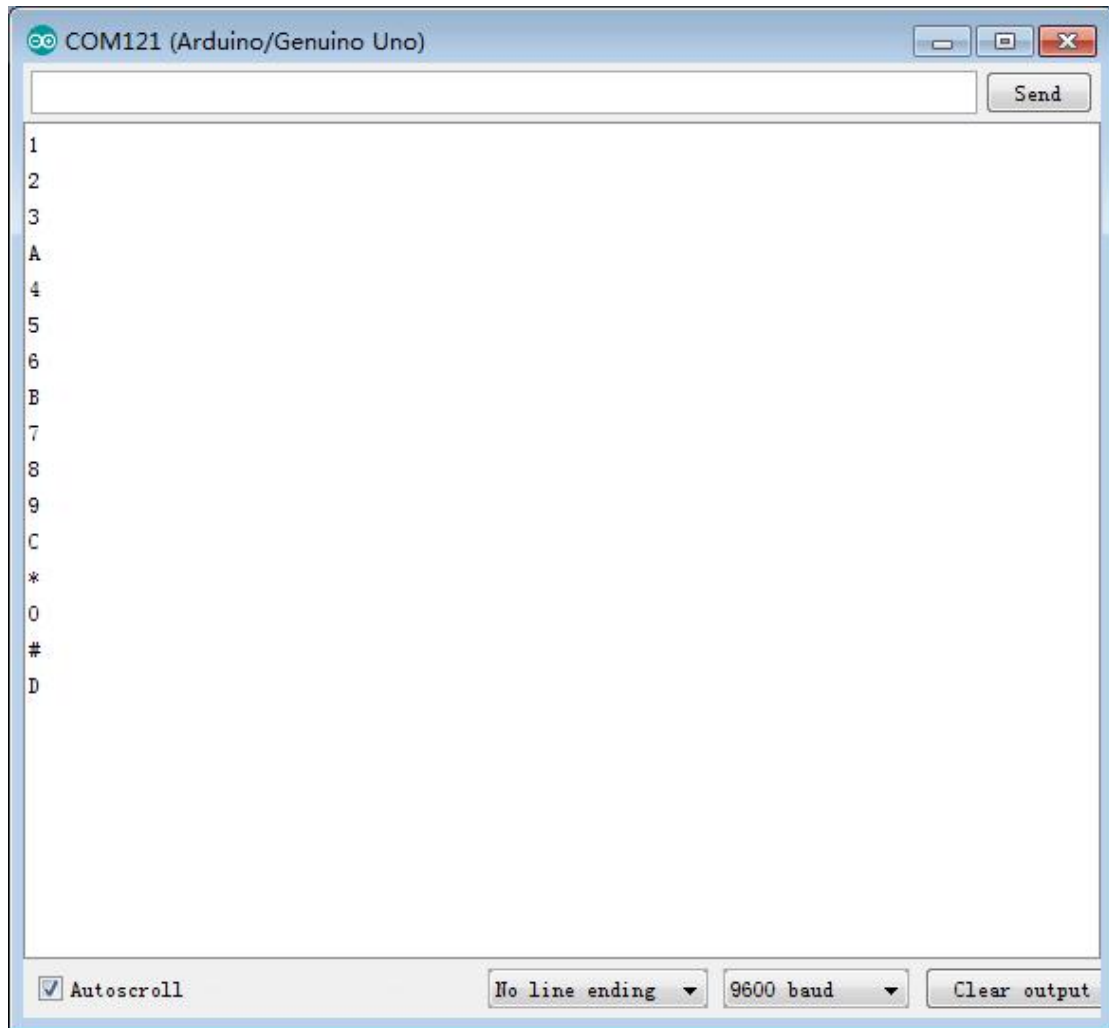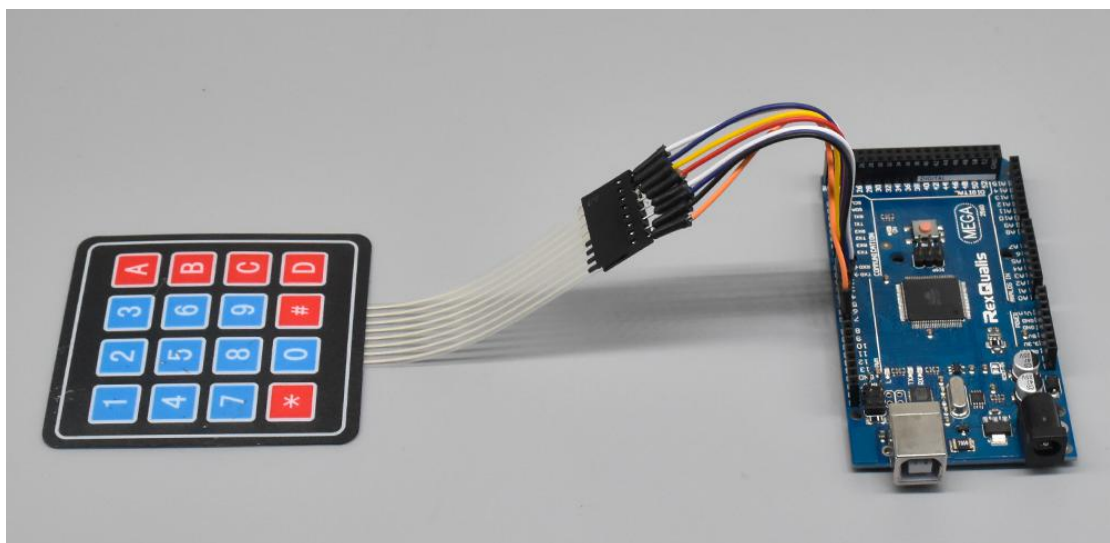
Step 4:Load the Libraries:Keypad

Step 5:Upload the code to the RexQualis Mega 2560 board.

Step 6:Open the Serial Monitor then you can see the data as blow:

(How to use the Serial Monitor is introduced in details in Lesson 0 Preface)

Then, when you press the Membrane Switch Module (Keypads), you can see the corresponding numbers and symbols on the monitor

You can see the video of the experiment results on YouTube:

https://youtu.be/5YwV4CpQz0k

If it isn't working, make sure you have assembled the circuit correctly, verified and uploaded the code to your board.For how to upload the code and install the library, check Lesson 0 Preface.