

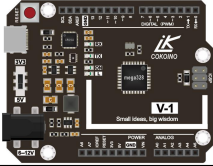

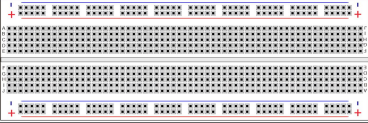











## 5.Button lights of competitive answering game

### ABOUT THIS PROJECT:

#### You will learn:

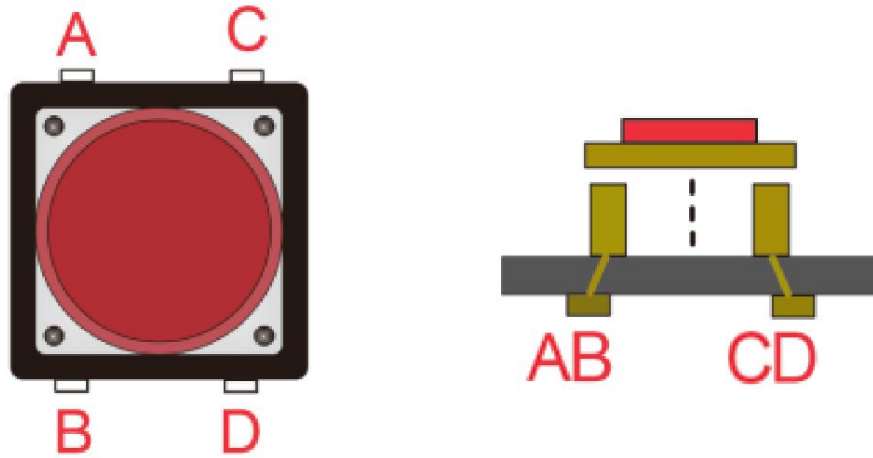
- ◆ Use the IO port of V-1 board to identify buttons and control the corresponding LED lights
- ◆ Make a button light circuit of competitive answering game

### 1. Things used in this project:

Hardware components	Picture	Quantity
V-1 board		1 PCS
30 CM USB Cable		1 PCS
Breadboard		1 PCS
9V Battery Snap Connector (you need to buy 9V battery yourself)		1 PCS
Breadboard power module		1 PCS
Male to Male DuPont Cable		17 PCS
Button		5PCS
Red, Green, Blue, Yellow Button Cap		5 PCS
10K Resistance		5 PCS
220R Resistance		4 PCS
F3 Red LED Light		1 PCS
F3 Green LED Light		1 PCS
F3 Blue LED Light		1 PCS
F3 White LED Light		1 PCS

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## 2. Pushbutton Introduction



Pushbuttons or switches connect two points in a circuit when you press them.

As shown above, when the button is pressed, AB is connected to the CD. When the hand is released, the button pops up and AB is disconnected from the CD.

## 3. Use V-1 board I/O Pins to identify buttons and control LED lights

Use the IO port of V-1 board to identify which button is pressed, and then output the high or low control LED to turn on or off. The main statement of this program is if...else...

In this project, when the pushbutton is open (unpressed), there is no connection between the two legs of the pushbutton, so the pin is connected to ground (through the pull-down resistor) and we read a LOW. When the button is closed (pressed), it makes a connection between its two legs, connecting the pin to 5 volts, so that we read a HIGH.

### 3.1 Code

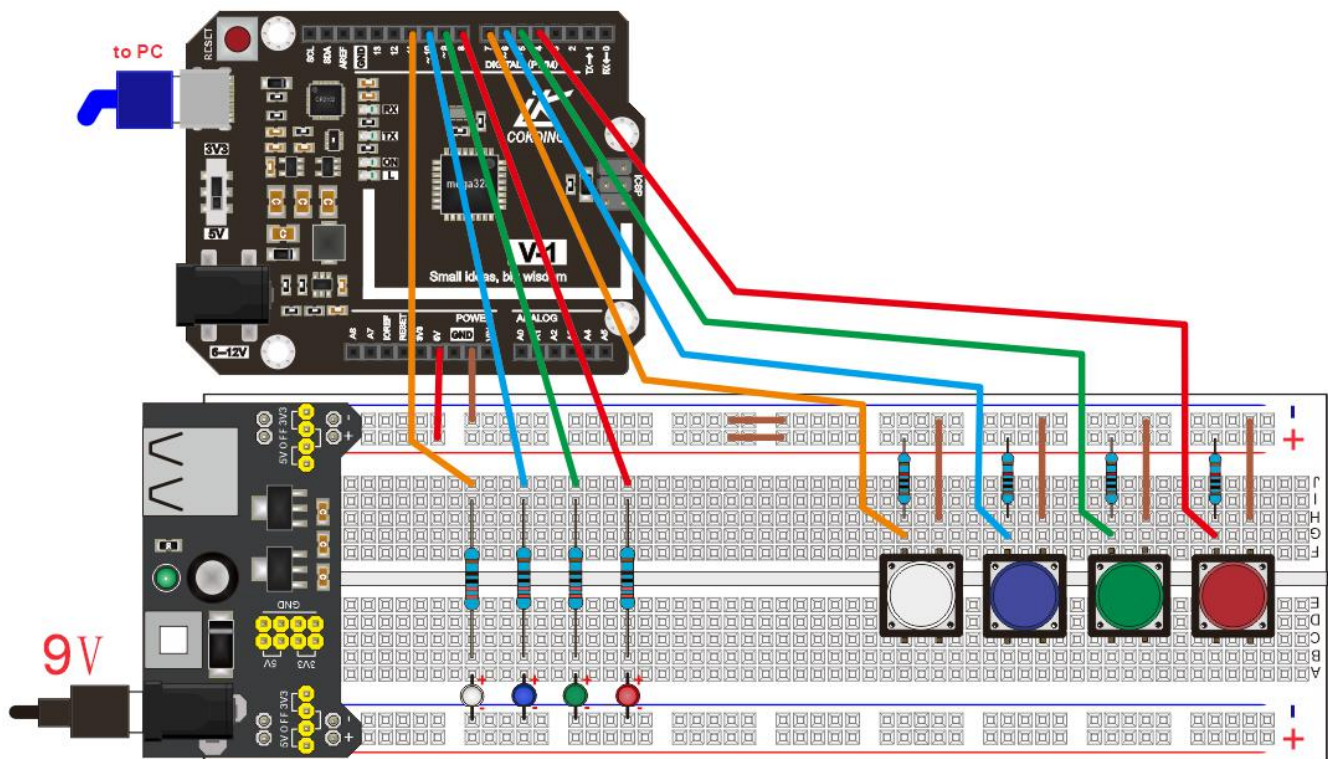
```
boolean key_1=false,key_2=false,key_3=false,key_4=false;
void setup() {
  pinMode(4,INPUT);
  pinMode(5,INPUT);
  pinMode(6,INPUT);
  pinMode(7,INPUT);
  pinMode(8,OUTPUT);
  pinMode(9,OUTPUT);
  pinMode(10,OUTPUT);
  pinMode(11,OUTPUT);
}
void loop() {
  if(digitalRead(4)==LOW){    //Use if statement and delay function to eliminate button jitter
    delay(10);
    if(digitalRead(4)==LOW){
      key_1 = !key_1;
      while(digitalRead(4)==LOW);
    }
  }
  if(digitalRead(5)==LOW){    //Determine if there is a button press
    delay(10);                //Delay 10 milliseconds
    if(digitalRead(5)==LOW){   //Determine if the button is pressed, if it is actually pressed
      key_2 = !key_2;         //Execute the code inside the judgment statement
    }
  }
}
```

```

while(digitalRead(5)==LOW); //Waiting for the button to let go
}
}
if(digitalRead(6)==LOW){
  delay(10);
  if(digitalRead(6)==LOW){
    key_3 = !key_3;
    while(digitalRead(6)==LOW);
  }
}
if(digitalRead(7)==LOW){
  delay(10);
  if(digitalRead(7)==LOW){
    key_4 = !key_4;
    while(digitalRead(7)==LOW);
  }
}
if(key_1==true) {digitalWrite(8,HIGH);}
else           {digitalWrite(8,LOW);}
if(key_2==true) {digitalWrite(9,HIGH);}
else           {digitalWrite(9,LOW);}
if(key_3==true) {digitalWrite(10,HIGH);}
else           {digitalWrite(10,LOW);}
if(key_4==true) {digitalWrite(11,HIGH);}
else           {digitalWrite(11,LOW);}
}

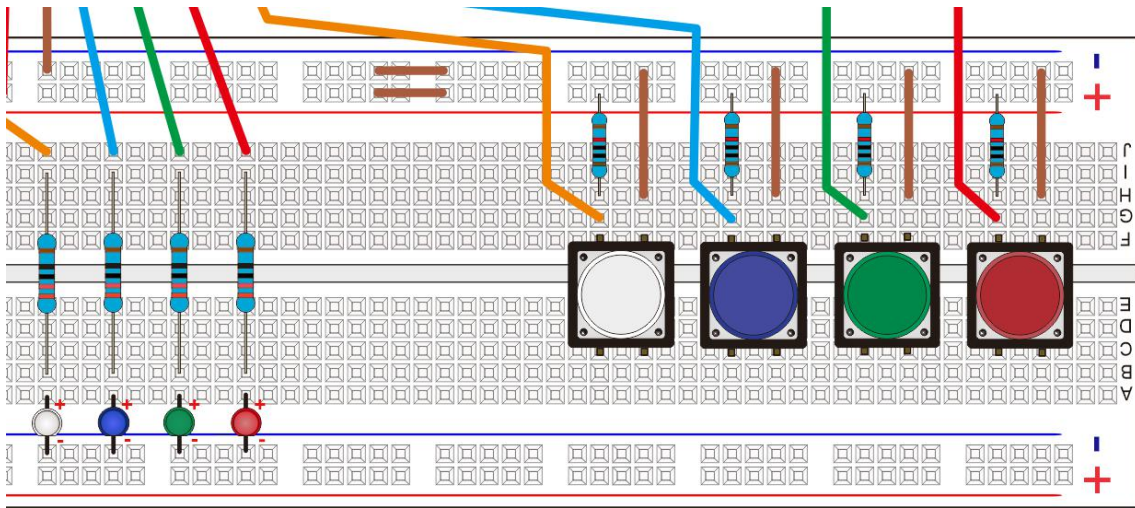
```

### 3.2 Connection Diagram



Note: The longest pin of RGB led is positive and the other three pins are cathode. The long pins of the red, green, and blue LEDs are positive and the short pins are cathodes.

## Detail enlargement



## 3.3 Step

3.3.1 Connect the computer and V-1 board with a USB cable and copy the above sample code to the Arduino IDE as shown below:

```
key_control_lamp | Arduino 1.8.5
File Edit Sketch Tools Help

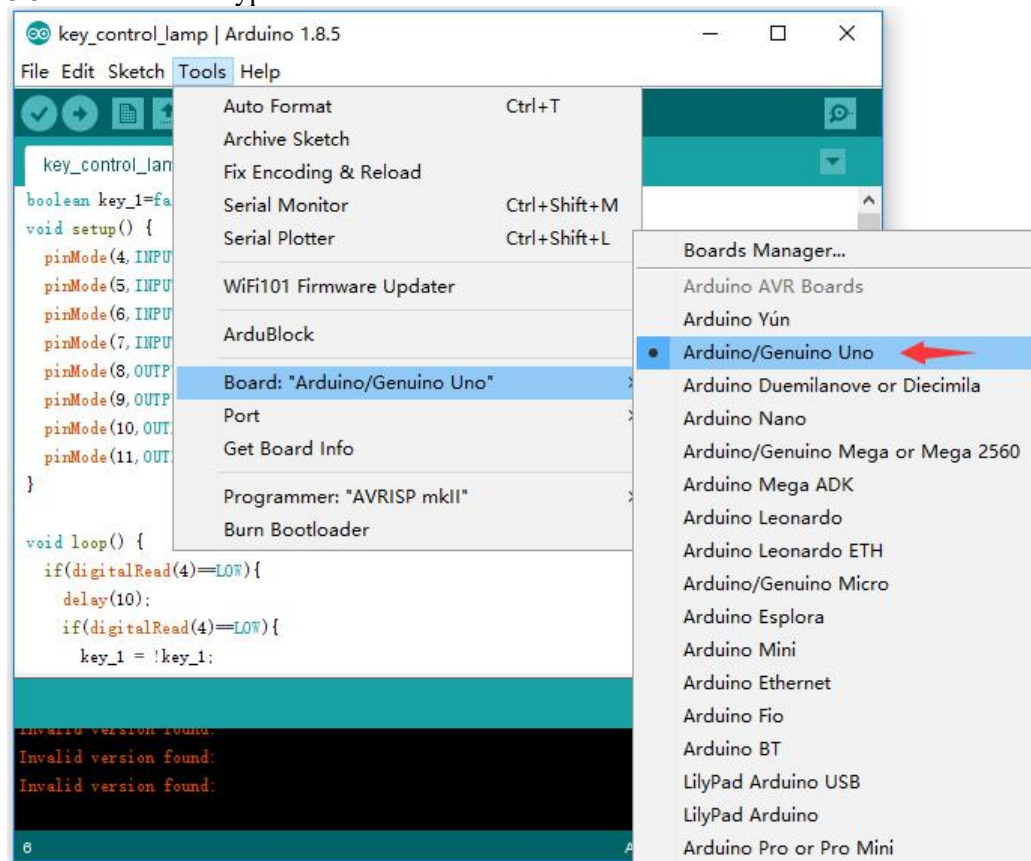
key_control_lamp

boolean key_1=false, key_2=false, key_3=false, key_4=false;
void setup() {
  pinMode(4, INPUT);
  pinMode(5, INPUT);
  pinMode(6, INPUT);
  pinMode(7, INPUT);
  pinMode(8, OUTPUT);
  pinMode(9, OUTPUT);
  pinMode(10, OUTPUT);
  pinMode(11, OUTPUT);
}

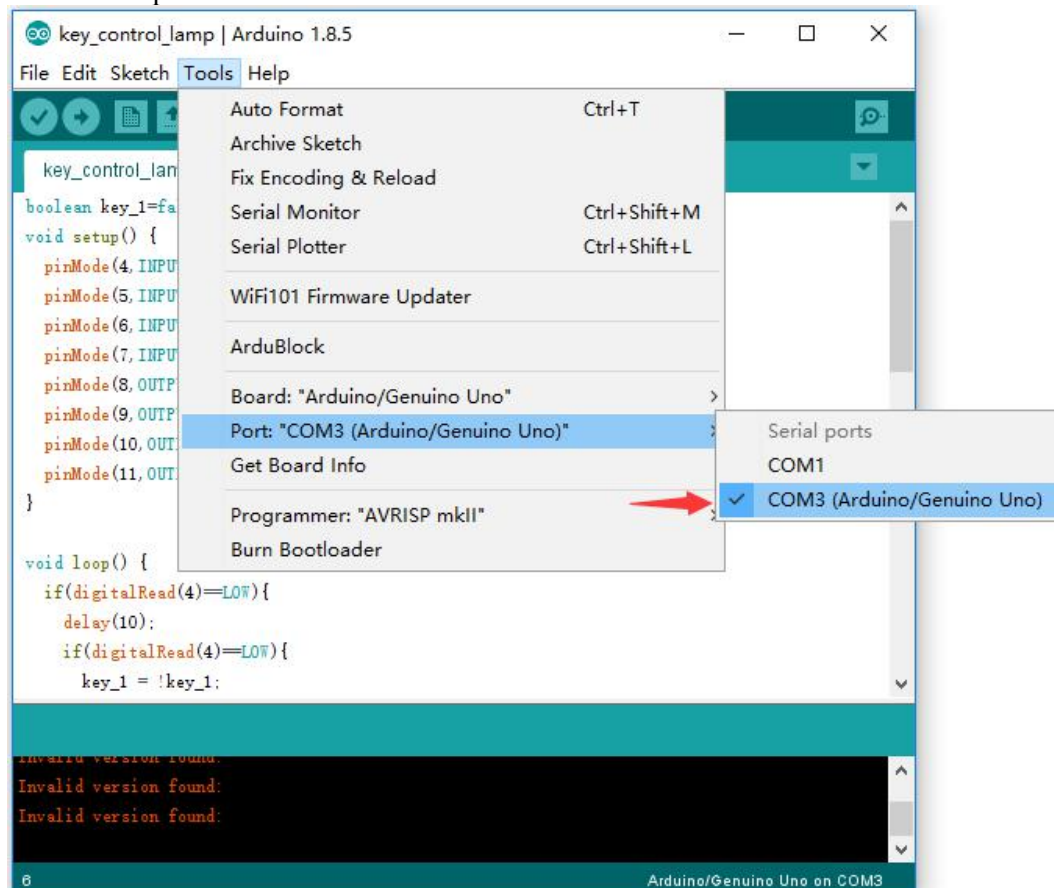
void loop() {
  if(digitalRead(4)==LOW){
    delay(10);
    if(digitalRead(4)==LOW){
      key_1 = !key_1;
    }
  }
}
```

Arduino/Genuino Uno on COM3

### 3.3.2 Select board type

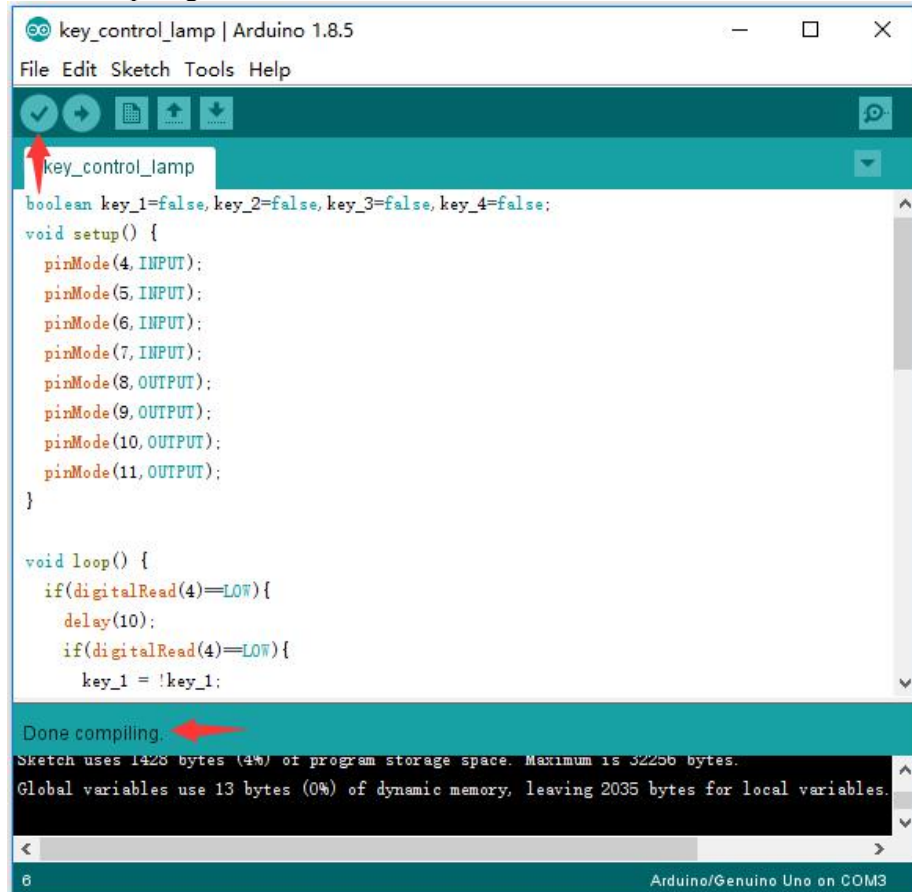


### 3.3.3 Select port

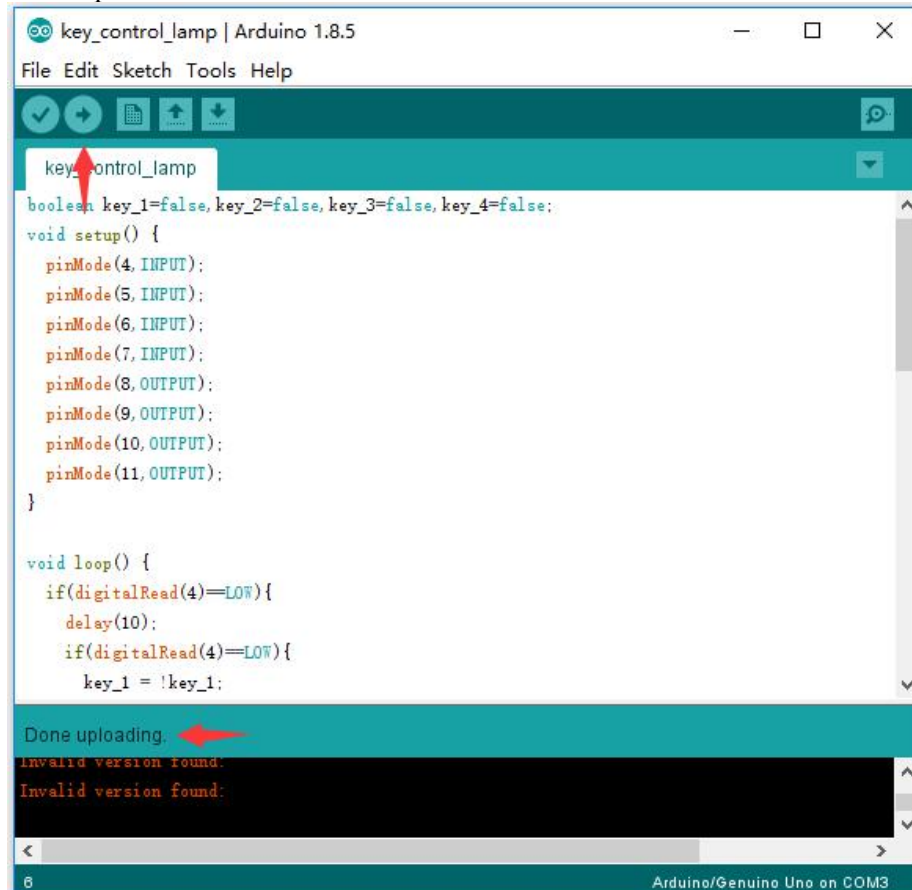




### 3.3.4 Compiling



### 3.3.5 Upload the sketch



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### 3.3.6 Result

Unplug the USB cable from the V-1 board, connect power module to the external power supply, and then turn on the switch of the power module on the breadboard. When you press a button of a different color, the LED that it controls will light up, and pressing it again will turn it off.

## 4. Make a button light circuit of competitive answering game

In the above we have learned how the buttons work and the basic programming, now let's make a button light circuit of competitive answering game.

### 4.1 Code

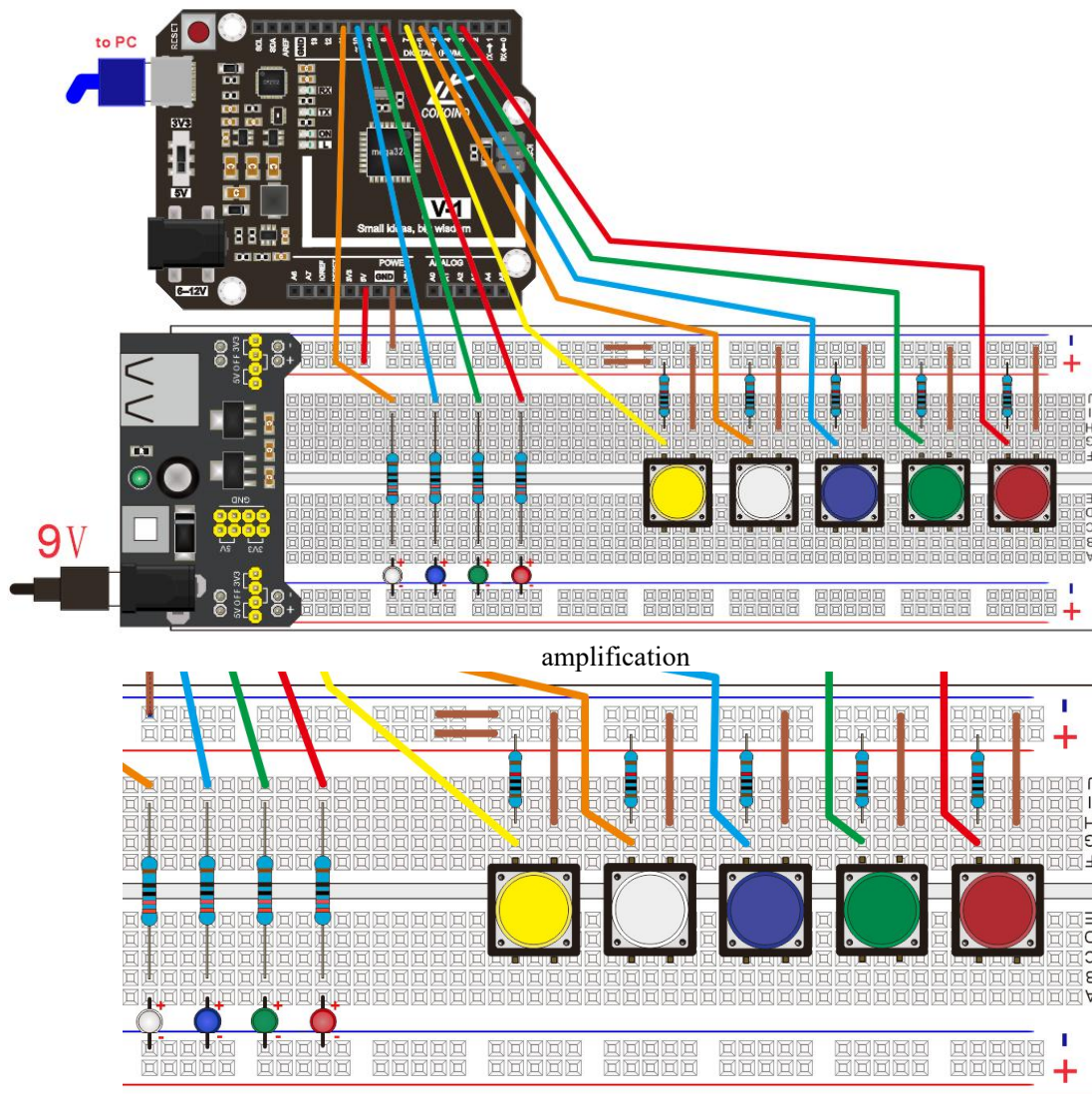
```
boolean key_1=false,key_2=false,key_3=false,key_4=false;
void setup() {
  pinMode(3,INPUT);
  pinMode(4,INPUT);
  pinMode(5,INPUT);
  pinMode(6,INPUT);
  pinMode(7,INPUT);
  pinMode(8,OUTPUT);
  pinMode(9,OUTPUT);
  pinMode(10,OUTPUT);
  pinMode(11,OUTPUT);
}
void loop() {
  if(digitalRead(7)==LOW){
    delay(10);
    if(digitalRead(7)==LOW){
      key_1=false,key_2=false,key_3=false,key_4=false;
      while(digitalRead(7)==LOW);
    }
  }
  if(key_1==false&&key_2==false&&key_3==false&&key_4==false){
    if(digitalRead(3)==LOW){
      delay(10);
      if(digitalRead(3)==LOW){
        key_1 = !key_1;
        while(digitalRead(3)==LOW);
      }
    }
    if(digitalRead(4)==LOW){
      delay(10);
      if(digitalRead(4)==LOW){
        key_2 = !key_2;
        while(digitalRead(4)==LOW);
      }
    }
    if(digitalRead(5)==LOW){
      delay(10);
      if(digitalRead(5)==LOW){
        key_3 = !key_3;
        while(digitalRead(5)==LOW);
      }
    }
    if(digitalRead(6)==LOW){
      delay(10);
      if(digitalRead(6)==LOW){
```

```

key_4 = !key_4;
while(digitalRead(6)==LOW);
}
}
if(key_1==true) {digitalWrite(8,HIGH);}
else {digitalWrite(8,LOW);}
if(key_2==true) {digitalWrite(9,HIGH);}
else {digitalWrite(9,LOW);}
if(key_3==true) {digitalWrite(10,HIGH);}
else {digitalWrite(10,LOW);}
if(key_4==true) {digitalWrite(11,HIGH);}
else {digitalWrite(11,LOW);}
}

```

## 4.2 Connection Diagram



## 4.3 Experiment

Unplug the USB cable from the V-1 board, connect the power module to the external power supply, and then turn on the switch of the power module on the breadboard.

In the circuit, the button controls the LED with the same color, which button is pressed first, and the LED of the corresponding color is illuminated. The yellow button acts as a reset button.