What is interrupt

CPU execution is originally executed one by one down the sequence of program instructions. But if a certain event happened at this time B requests the CPU to process (interrupt) quickly, CPU interrupt the current work, temporarily turned to handle events B (interrupt response and interrupt service). After being CPU will be processed event B, go back to the original interrupted by place continue to execute a program (interrupt return), a process called interrupt.

UNO interrupt

interrupt types

	Arduino UNO
interrupt types	Int .1 (D2pin) Int .2(D3pin)
External interrupt trigger mode	Interrupt mde LOW (low level) CHANGE(Level change) RISING(Rising edge) FALLING(Falling edge) HIGH(High level)

The interrupt function

The interrupt function	**Arduino UNO**
External	Setup a prior declaration AttachInterrupt (interrupt, function, mode) Call interrupt function
Internal	Setup a prior declaration void set(unsigned long ms,void(*f)()) void start();

attachInterrupt function

attachInterrupt(interrupt,function,mode)

- interrupt：The interrupt number, UNO, USES only 0,1, that is, D2, D3
- function：Call interrupt function, which is called when the interrupt occurs
- mode：Interrupt trigger mode

Note: this function is placed in void setup()

types	interrupt mode	explaination
level trigger	LOW	Low level trigger
	HIGH	High level trigger (this interrupt mode only applies to Arduino due)
edge trigger	RISING	Rise trigger
	FALLING	Drop edge trigger
	CHANGE	Level changes, high level changes to low level, low level changes to high level

Code

```
void setup(){
}
void loop()
{
noInterrupts();
//Important, time-sensitive code
interrups();
//The rest of the code is written here
}
```

Experiment 1 external interrupt

The experiment equipments

- Uno Development board
- Supporting USB cable
- Breadboard
- Dupont lines
- LED lamp module *1
- Tilt sensor module *1

The experimental principle

The tilting sensor is connected to the digital pin 2 (interrupt 0), and the LED light is not on. When the vibration is generated, the LED light is triggered, and the LED light becomes bright. After one loop, the LED light exits the interrupt, and the LED light is not on.

Experiment wiring circuit

Arduino UNO	Tilting switch module
2	DO

5V	VCC(+)
GND	GND(-)

Arduino UNO	LED
11	+
GND	—
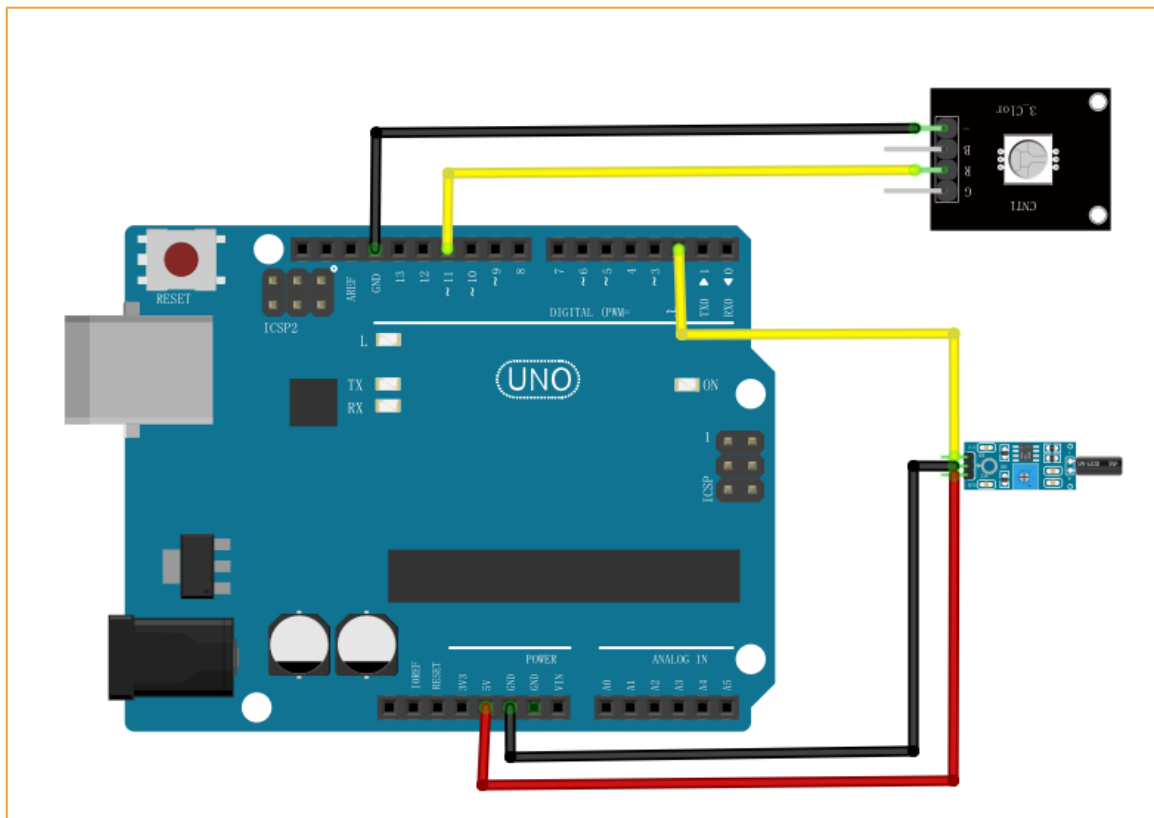
Arduino ID programming program

The program path：ArduionIDE   The sample program\External_interrupt\ External_interrupt.ino
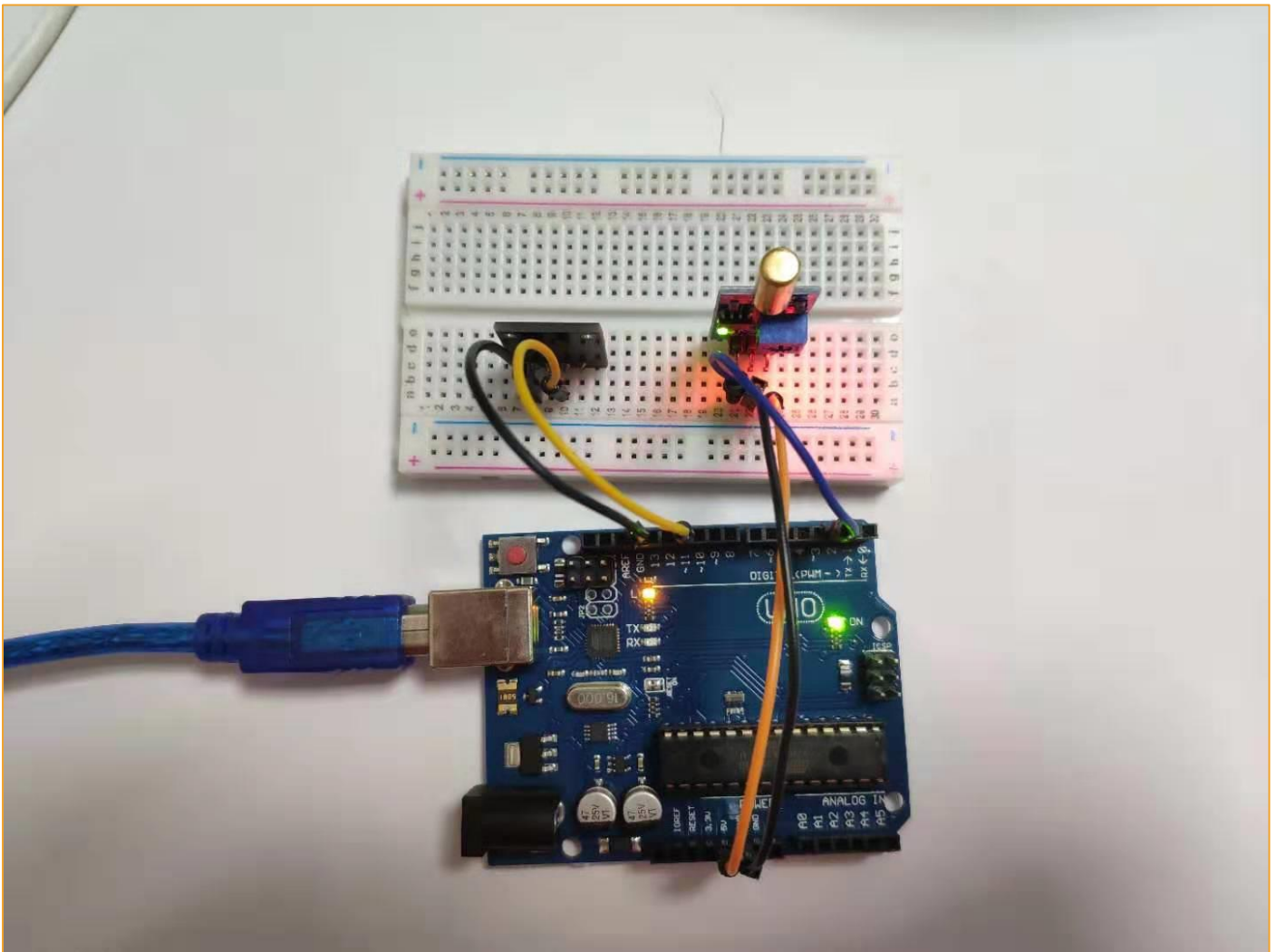
```
int SensorLED = 11;
int SensorINPUT = 2;
volatile int state = LOW;

void setup()
 {
  pinMode(SensorLED, OUTPUT);
  pinMode(SensorINPUT, INPUT_PULLUP);
  attachInterrupt(0, blink, FALLING);
}
void loop() {
  if (state == HIGH) {
```

```
    state = LOW;
    digitalWrite(SensorLED, HIGH);
    delay(500);
  }
  else {
    digitalWrite(SensorLED, LOW);
  }
}
void blink() {
  state = !state;
}
```

The experimental result

# Experiment 2 internal interrupt

The experiment equipments

- Uno Development board
- Supporting USB cable
- Breadboard
- Dupont lines
- LED lamp module *1

The experimental principle

When the timer overflows, it triggers the interrupt, and the LED light turns on. After one loop, it exits the interrupt, and the LED light does not work.

The experiment Timer wiring

Arduino UNO	LED
11	+
GND	—
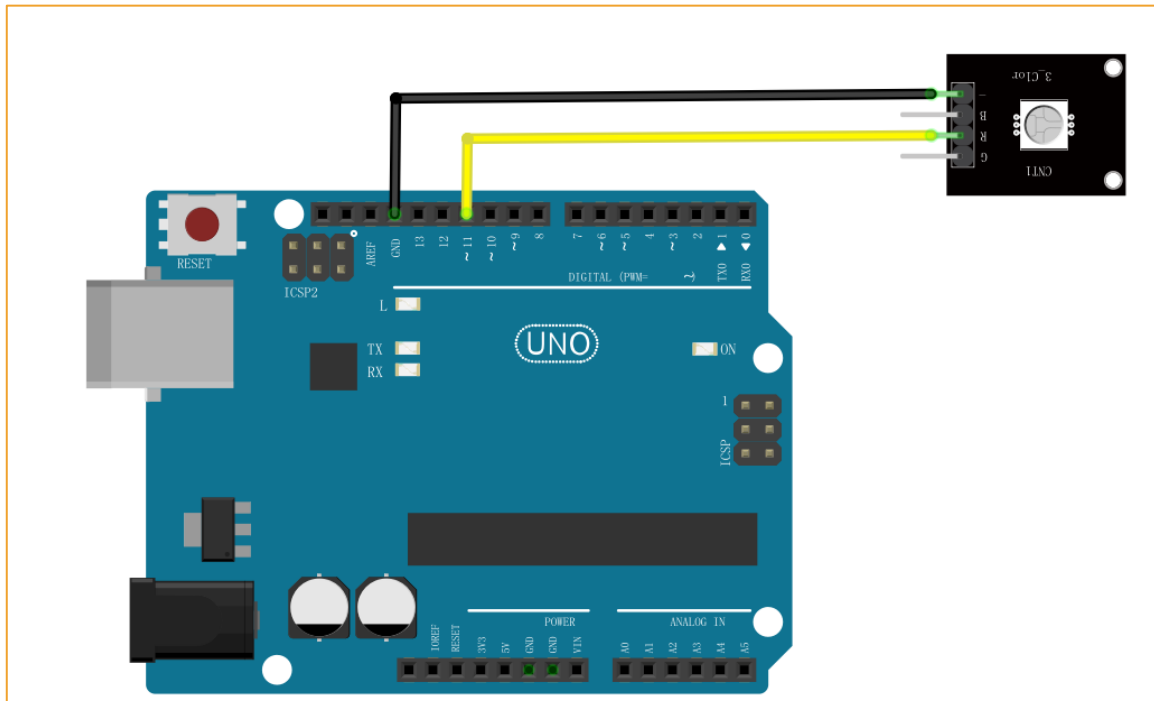
Arduino IDE proramming program

The program path：ArduionIDE the sample program \ Internal_interrupt\ Internal_interrupt.ino

```
#include "MsTimer2.h"
void flash()
```

```
{
  static boolean output = 1;
  digitalWrite(11,output);
  delay(10);
  output = !output;
}
void setup()
{
  pinMode(13, OUTPUT);
    MsTimer2::set(1000, flash);
     MsTimer2::start();
}


void loop(){}
```

Experiment results