Virtual Reality Haptic Interactions (虛擬實境與觸覺回饋互動)

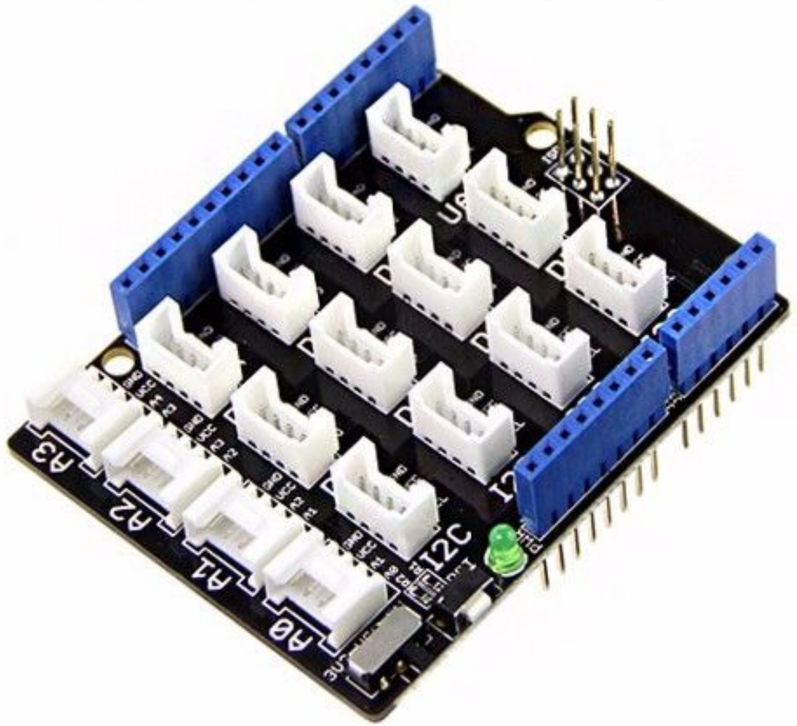
Lecturer: Ray
Week 3 (9/25)

Parts list

- 1*Base Shield
- 1*Grove - LCD RGB Backlight
- 1*Grove - Smart Relay
- 1*Grove - Buzzer
- 1*Grove - Sound Sensor
- 1*Grove - Touch Sensor
- 1*Grove - Rotary Angle Sensor
- 1*Grove - Temperature Sensor
- 1*Grove - LED
- 1*Grove - Light Sensor
- 1*Grove – Button
- 1*DIP LED Blue-Blue
- 1*DIP LED Green-Green
- 1*DIP LED Red-Red
- 1*Mini Servo 10*Grove Cables
- 1*9V to Barrel Jack Adapter
- 1*Grove starter kit Manual
- 1*Green Plastic Box

Parts list

- 1*Base Shield
- 1*Grove - LCD RGB Backlight
- 1*Grove - Sma
- 1*Grove - Buz
- 1*Grove - Sou
- 1*Grove - Tou
- 1*Grove - Rot
- 1*Grove - Tem
- 1*Grove - LED



- 1*Grove - Light Sensor
- 1*Grove - Button
- lue-Blue
- reen-Green
- ed-Red
- 10*Grove Cables
- el Jack Adapter
- ter kit Manual
- 1*Green Plastic Box

Parts list

- 1*Base Shield
- 1*Grove - LCD RGB Backlight
- 1*Grove -
- 1*Grove -
- 1*Grove -
- 1*Grove -
- 1*Grove -
- 1*Grove -
- 1*Grove - LED
- 1*Grove - Light Sensor
- 1*Grove – Button
- ples
- er
- 1*Green Plastic Box

Parts list

- 1*Base Shield
- 1*Grove - LCD RGB Backlight
- 1*Grove - Smart Relay
- 1*Grove - Buz
- 1*Grove - Sou
- 1*Grove - Tou
- 1*Grove - Rot
- 1*Grove - Tem
- 1*Grove - LED
- 1*Grove - Light Sensor
- 1*Grove – Button
- 1*DIP LED Blue-Blue

en

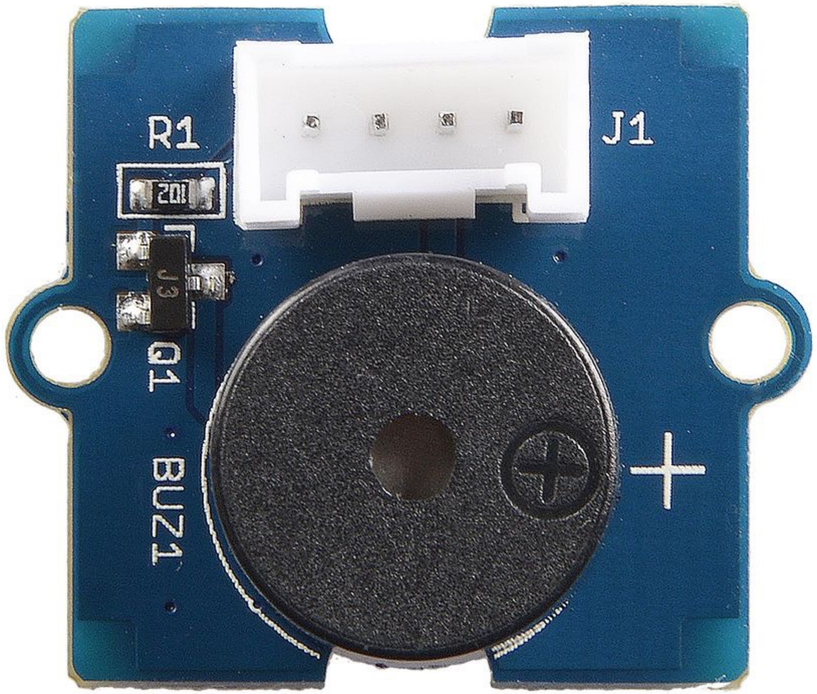
Cables

apter

nual

Parts list

- 1*Base Shield
- 1*Grove - LCD RGB Backlight
- 1*Grove - Smart Relay
- 1*Grove - Buzzer
- 1*Grove - Sound Sensor
- 1*Grove - Touch Sensor
- 1*Grove - Rotary Angle Sensor
- 1*Grove - Temperature Sensor
- 1*Grove - LED
- 1*Grove - Light Sensor



- 1*Green Plastic Box

Parts list

- 1*Base Shield
- 1*Grove - LCD RGB Backlight
- 1*Grove - Smart Relay
- 1*Grove - Buzzer
- 1*Grove - Sound Sensor
- 1*Grove - Touch Sensor
- 1*Grove - Rotary Angle Sensor
- 1*Grove - Temperature Sensor
- 1*Grove - LED
- 1*Grove - Light Sensor
- 1*Grove - Button

- 1*Green Plastic Box

Parts list

- 1*Base Shield
- 1*Grove - LCD RGB Backlight
- 1*Grove - Smart Relay
- 1*Grove - Buzzer
- 1*Grove - Sound Sensor
- 1*Grove - Touch Sensor
- 1*Grove - Rotary Angle Sensor
- 1*Grove - Temperature Sensor
- 1*Grove - LED
- 1*Grove - Light Sensor

bles

- 1*9V to Barrel Jack Adapter
- 1*Grove starter kit Manual
- 1*Green Plastic Box

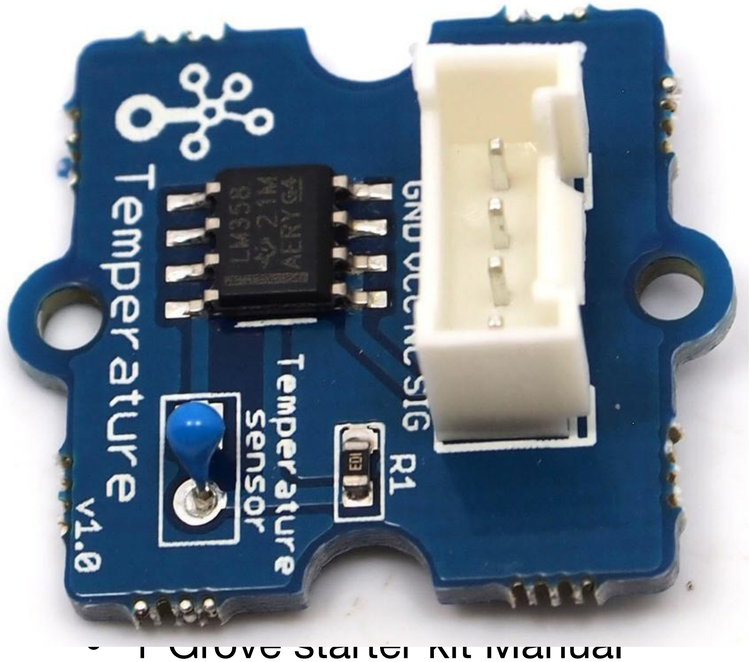
Parts list

- 1*Base Shield
- 1*Grove - LCD RGB Backlight
- 1*Grove - Smart Relay
- 1*Grove - Buzzer
- 1*Grove - Sound Sensor
- 1*Grove - Touch Sensor
- 1*Grove - Rotary Angle Sensor
- 1*Grove - Temperature Sensor
- 1*Grove - LED

- 1*9V to Barrel Jack Adapter
- 1*Grove starter kit Manual
- 1*Green Plastic Box

Parts list

- 1*Base Shield
- 1*Grove - LCD RGB Backlight
- 1*Grove - Smart Relay
- 1*Grove - Buzzer
- 1*Grove - Sound Sensor
- 1*Grove - Touch Sensor
- 1*Grove - Rotary Angle Sensor
- 1*Grove - Temperature Sensor
- 1*Grove - LED
- 1*Grove - Light Sensor
- 1*Grove - Button
- 1*Grove starter kit Manual
- 1*Green Plastic Box



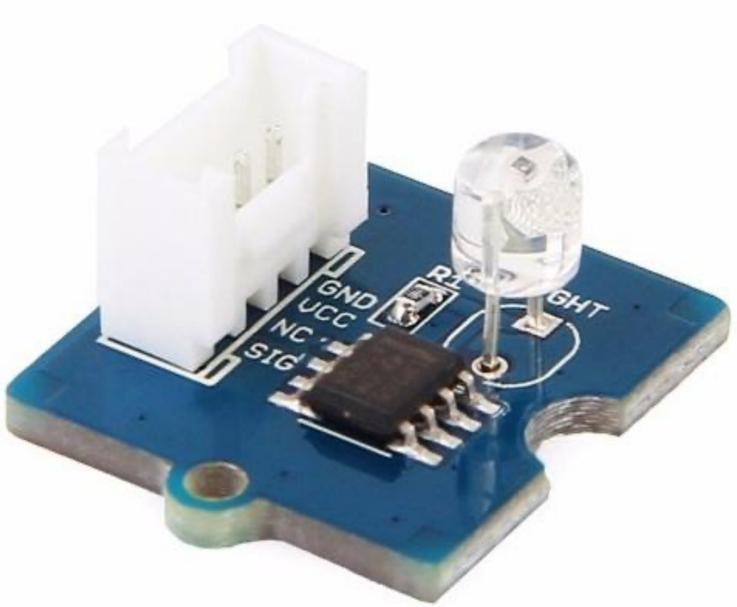
Parts list

- 1*Base Shield
- 1*Grove - LCD RGB Backlight
- 1*Grove - Smart Relay
- 1*Grove - Buzzer
- 1*Grove - Sound Sensor
- 1*Grove - Touch Sensor
- 1*Grove - Rotary Angle Sensor
- 1*Grove - Temperature Sensor
- 1*Grove - LED
- 1*Grove - Light Sensor
- 1*Grove – Button

- 1*Grove starter kit Manual
- 1*Green Plastic Box

Parts list

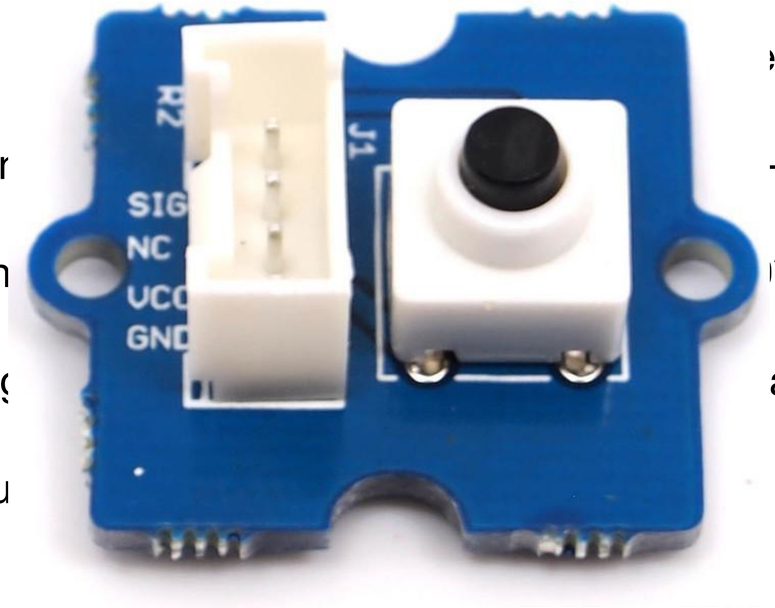
- 1*Base Shield
- 1*Grove - LCD RGB Backlight
- 1*Grove - Smart Rel
- 1*Grove - Buzzer
- 1*Grove - Sound Se
- 1*Grove - Touch Ser
- 1*Grove - Rotary An
- 1*Grove - Temperatu
- 1*Grove - LED



- 1*Grove - Light Sensor
- 1*Grove – Button
- -Blue
- n-Green
- Red
- *Grove Cables
- ack Adapter
- kit Manual
- 1*Green Plastic Box

Parts list

- 1*Base Shield
- 1*Grove - LCD RGB Backlight
- 1*Grove - Smart Relay
- 1*Grove - Buzzer
- 1*Grove - Sound Ser
- 1*Grove - Touch Sen
- 1*Grove - Rotary Ang
- 1*Grove - Temperatu
- 1*Grove - LED
- 1*Grove - Light Sensor
- 1*Grove – Button
- 1*DIP LED Blue-Blue



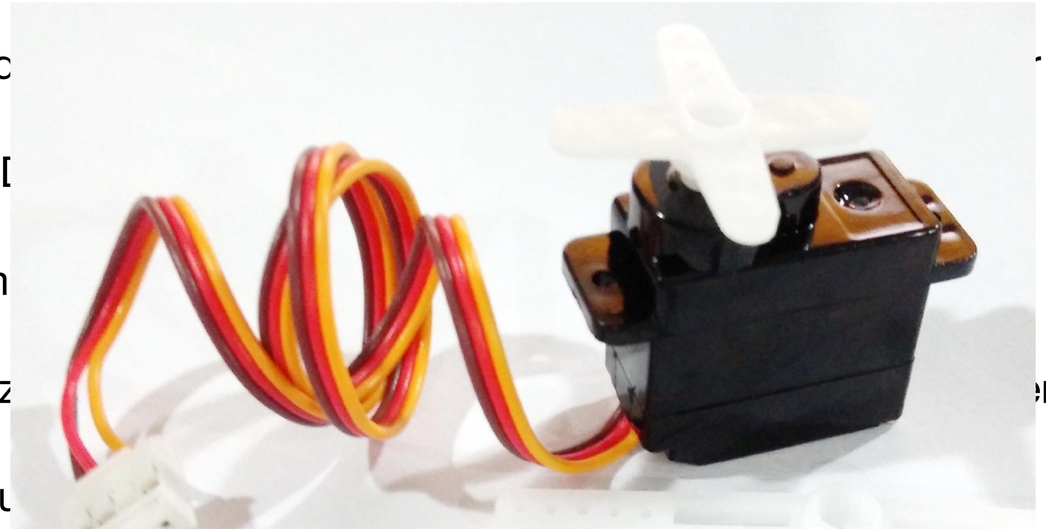
- en-Green
- -Red
- *Grove Cables
- ack Adapter
- kit Manual
- Box

Parts list

- 1*Base Shield
- 1*Grove - LCD RGB Backlight
- 1*Grove - Smart Relay
- 1*Grove - Buzzer
- 1*Grove - Sound Sensor
- 1*Grove - Touch Sensor
- 1*Grove - Rotary Angle Sensor
- 1*Grove - Temperature Sensor
- 1*Grove - LED
- 1*Grove - Light Sensor
- 1*Grove – Button
- 1*DIP LED Blue-Blue
- 1*DIP LED Green-Green
- 1*DIP LED Red-Red
- 1*Mini Servo 10*Grove Cables
- 1*9V to Barrel Jack Adapter
- 1*Grove starter kit Manual
- 1*Green Plastic Box

Parts list

- 1*Base Shield
- 1*Grove - LCD
- 1*Grove - Sm
- 1*Grove - Buz
- 1*Grove - Sou
- 1*Grove - Touch Sensor
- 1*Grove - Rotary Angle Sensor
- 1*Grove - Temperature Sensor
- 1*Grove - LED



- 1*Mini Servo 10*Grove Cables
- 1*9V to Barrel Jack Adapter
- 1*Grove starter kit Manual
- 1*Green Plastic Box

Parts list

- 1*Base Shield
- 1*Grove - LCD RGB Backlight
- 1*Grove - Smart Relay
- 1*Grove - Buzzer
- 1*Grove - Sound Sensor
- 1*Grove - Touch Sensor
- 1*Grove - Rotary Angle Sensor
- 1*Grove - Temperature Sensor
- 1*Grove - LED
- 1*Grove - Light Sensor
- 1*Grove – Button
- 1*DIP LED Blue-Blue
- 1*DIP LED Green-Green
- 1*DIP LED Red-Red
- 1*Mini Servo 10*Grove Cables
- 1*9V to Barrel Jack Adapter
- 1*Grove starter kit Manual
- 1*Green Plastic Box

Parts list

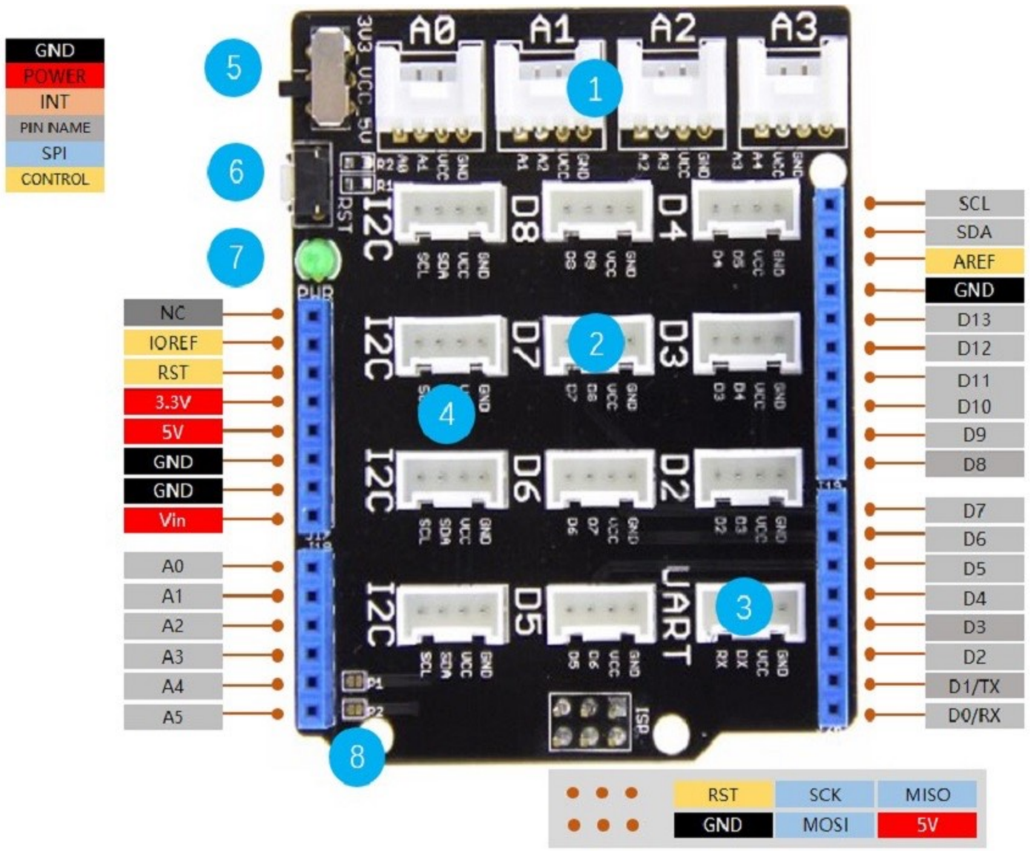
- 1*Base Shield
- 1*Grove - LCD RGB Ba
- 1*Grove - Smart Relay
- 1*Grove - Buzzer
- 1*Grove - Sound Sensc
- 1*Grove - Touch Sensor
- 1*Grove - Rotary Angle Sensor
- 1*Grove - Temperature Sensor
- 1*Grove - LED

- ght Sensor
- itton
- lue-Blue
- reen-Green
- ed-Red
- 1*Mini Servo 10*Grove Cables
- 1*9V to Barrel Jack Adapter
- 1*Grove starter kit Manual
- 1*Green Plastic Box

Parts list

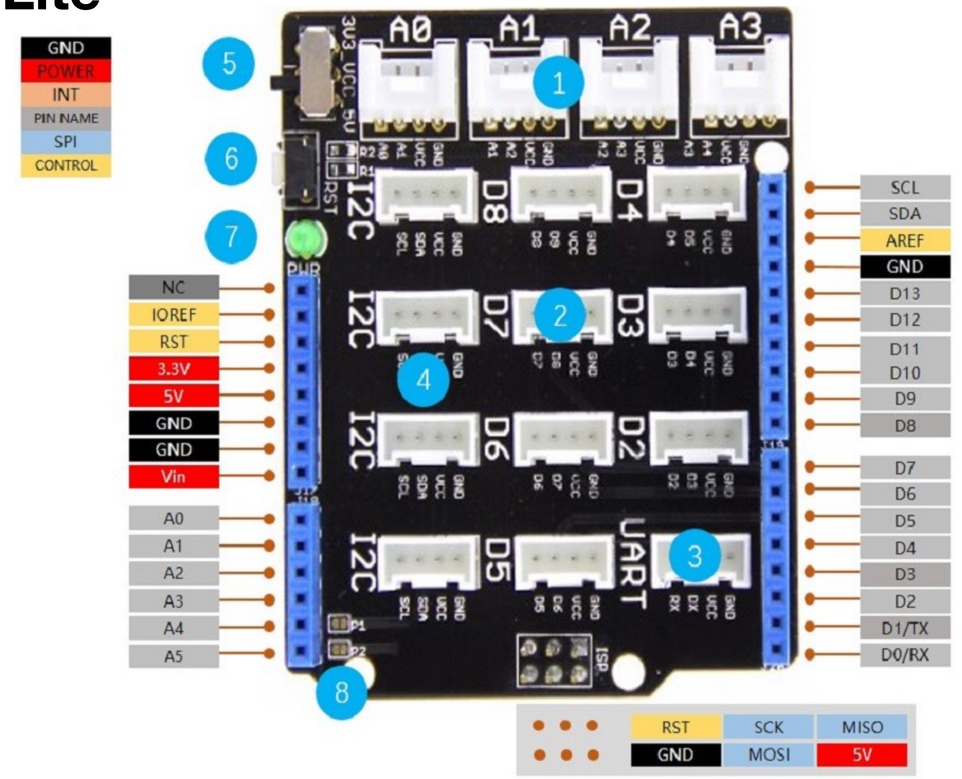
- 1*Base Shield
- 1*Grove - LCD RGB Backlight
- 1*Grove - Smart Relay
- 1*Grove - Buzzer
- 1*Grove - Sound Sensor
- 1*Grove - Touch Sensor
- 1*Grove - Rotary Angle Sensor
- 1*Grove - Temperature Sensor
- 1*Grove - LED
- 1*Grove - Light Sensor
- 1*Grove – Button
- 1*DIP LED Blue-Blue
- 1*DIP LED Green-Green
- 1*DIP LED Red-Red
- 1*Mini Servo 10*Grove Cables
- 1*9V to Barrel Jack Adapter
- 1*Grove starter kit Manual
- 1*Green Plastic Box

Base Shield


GND
POWER
INT
PIN NAME
SPI
CONTROL
A0
A1
A2
A3
I2C
D8
D4
D7
D3
D6
D2
D5
UART
RST
PWR
ISD
1
2
3
4
5
6
7
8
NC
IOREF
RST
3.3V
5V
GND
GND
Vin
A0
A1
A2
A3
A4
A5
SCL
SDA
AREF
GND
D13
D12
D11
D10
D9
D8
D7
D6
D5
D4
D3
D2
D1/TX
D0/RX
RST
SCK
MISO
GND
MOSI
5V

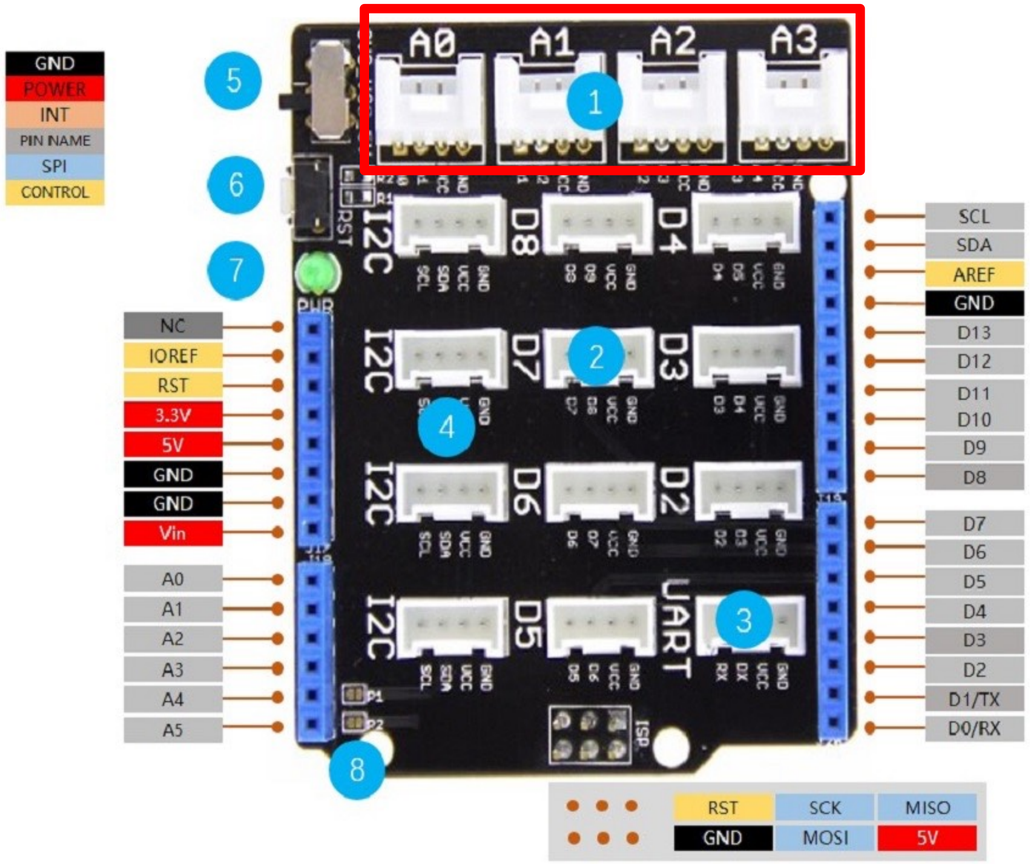
Base Shield

- **Compatible Boards:**
- **Arduino Uno(all revisions)/Seeeduino(V4&V4.2)**
- **Arduino Mega/Seeeduino Mega**
- **Arduino Zero(M0)/Seeeduino Lorawan**
- **Arduino Leonardo/Seeeduino Lite**
- **Arduino 101**
- **Arduino Due 3.3V**
- **Intel Edison 5V**
- **Linkit One**



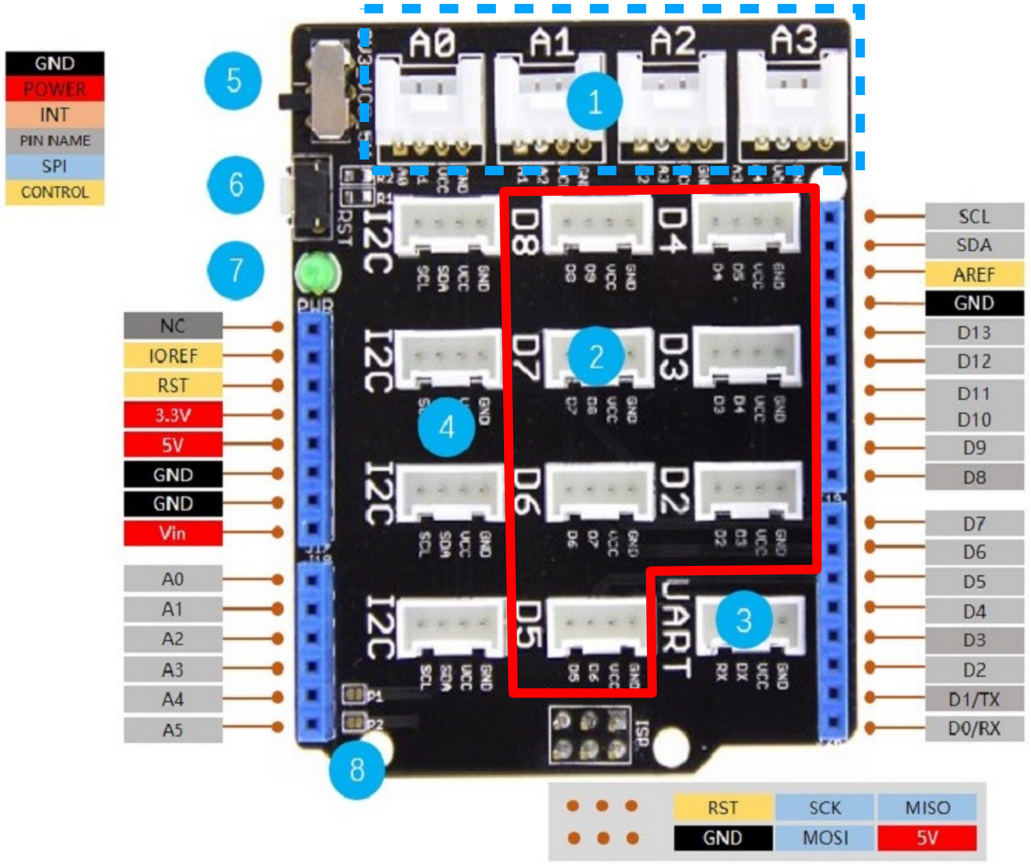
Base Shield

1-Analog Ports: include 4 analog ports, A0, A1, A2 and A3.



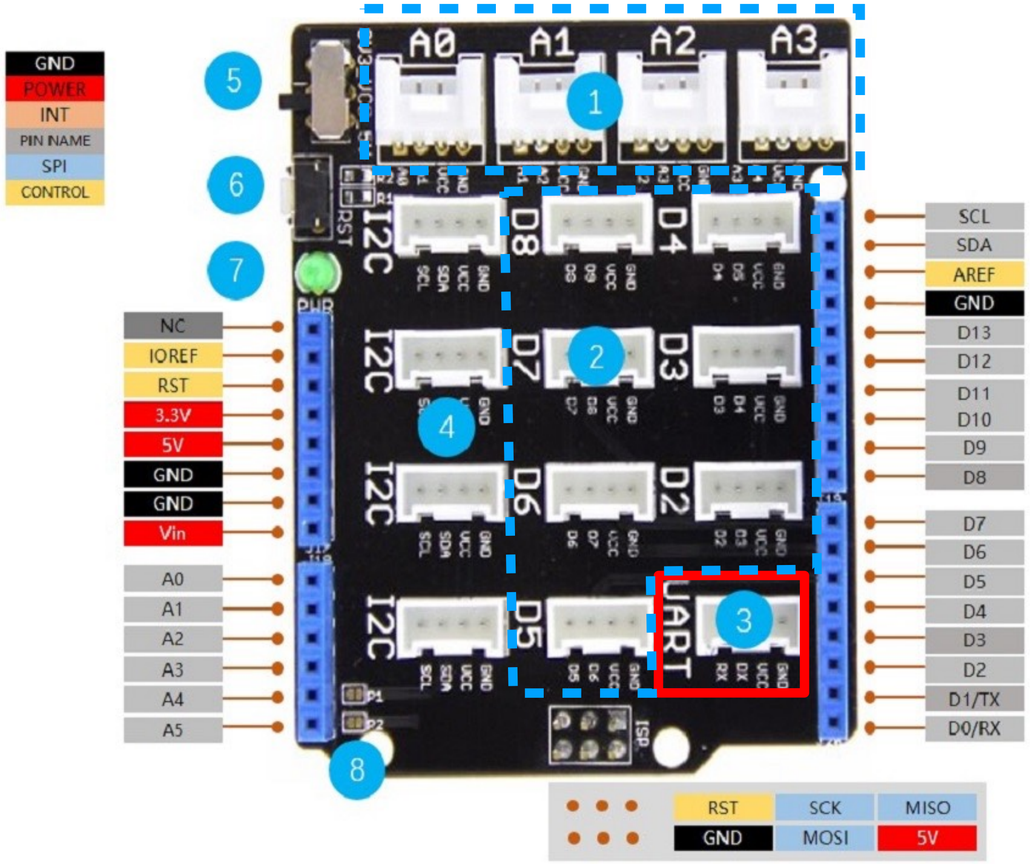
Base Shield

2-Digital Ports: include 7 digital ports, D2, D3, D4, D5, D6, D7 and D8.



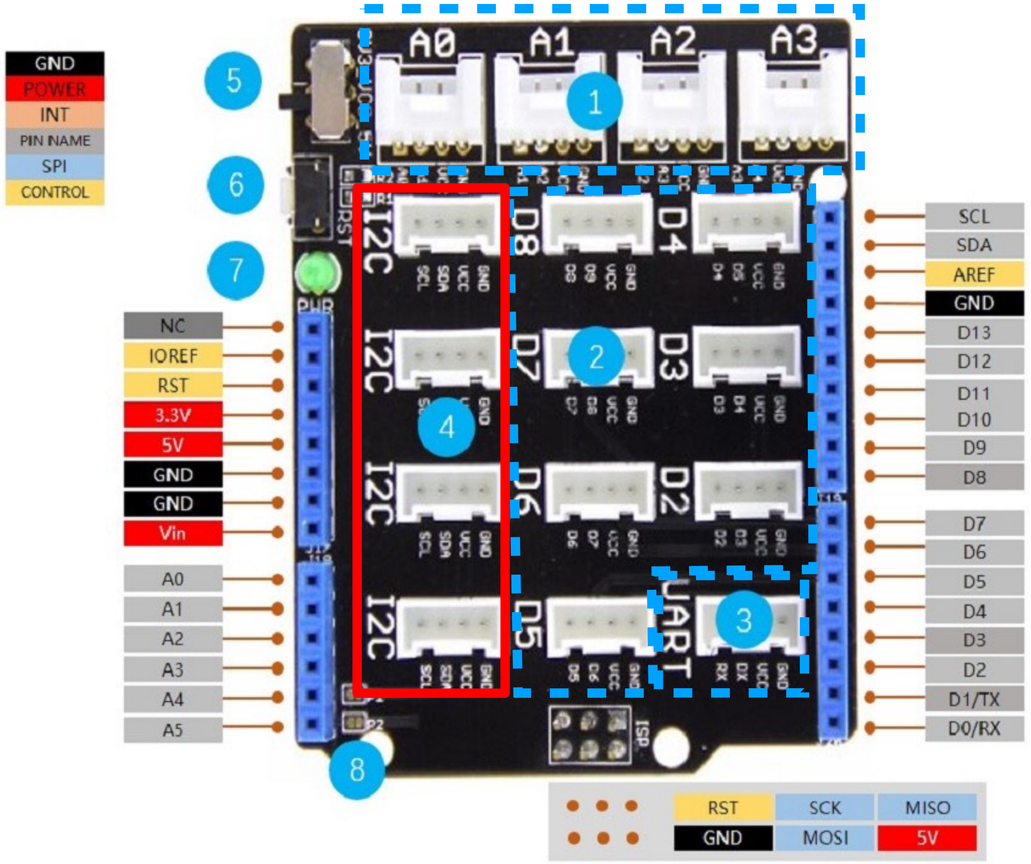
Base Shield

3-UART Port: 1 UART port.



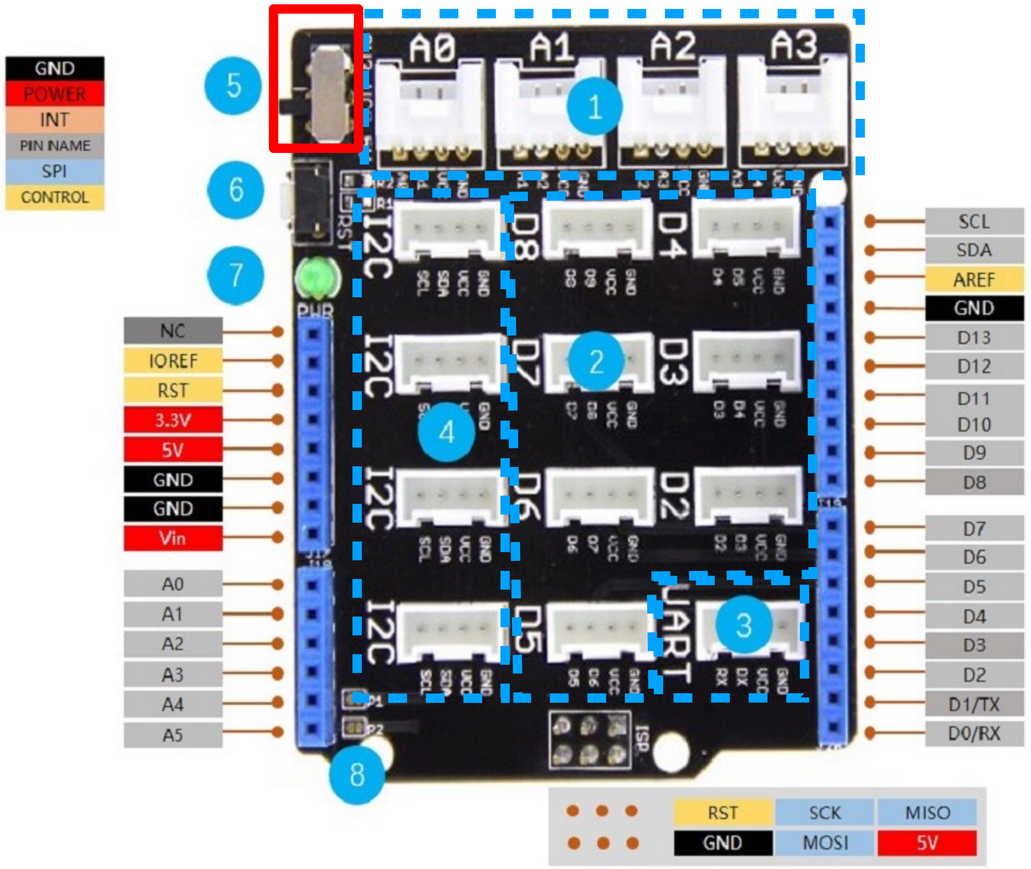
Base Shield

4-I2C Ports: 4 I2C ports.



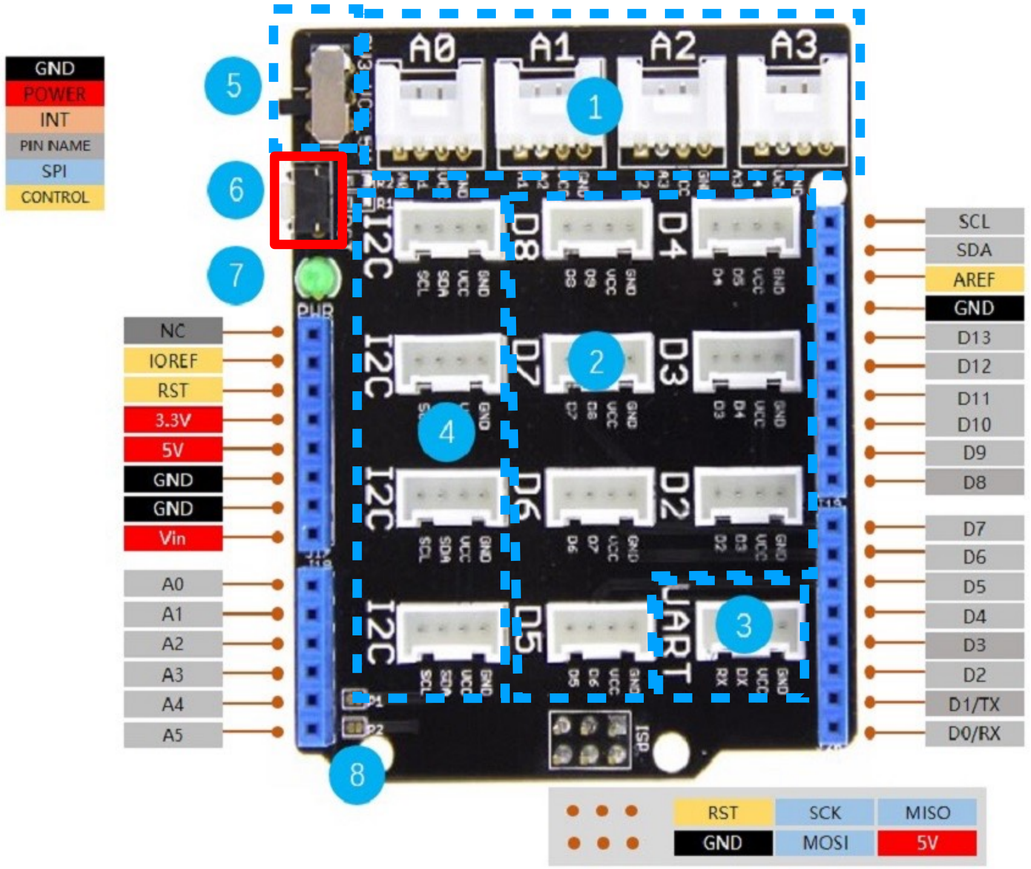
Base Shield

5-Power Switch (Arduino UNO: 5V)



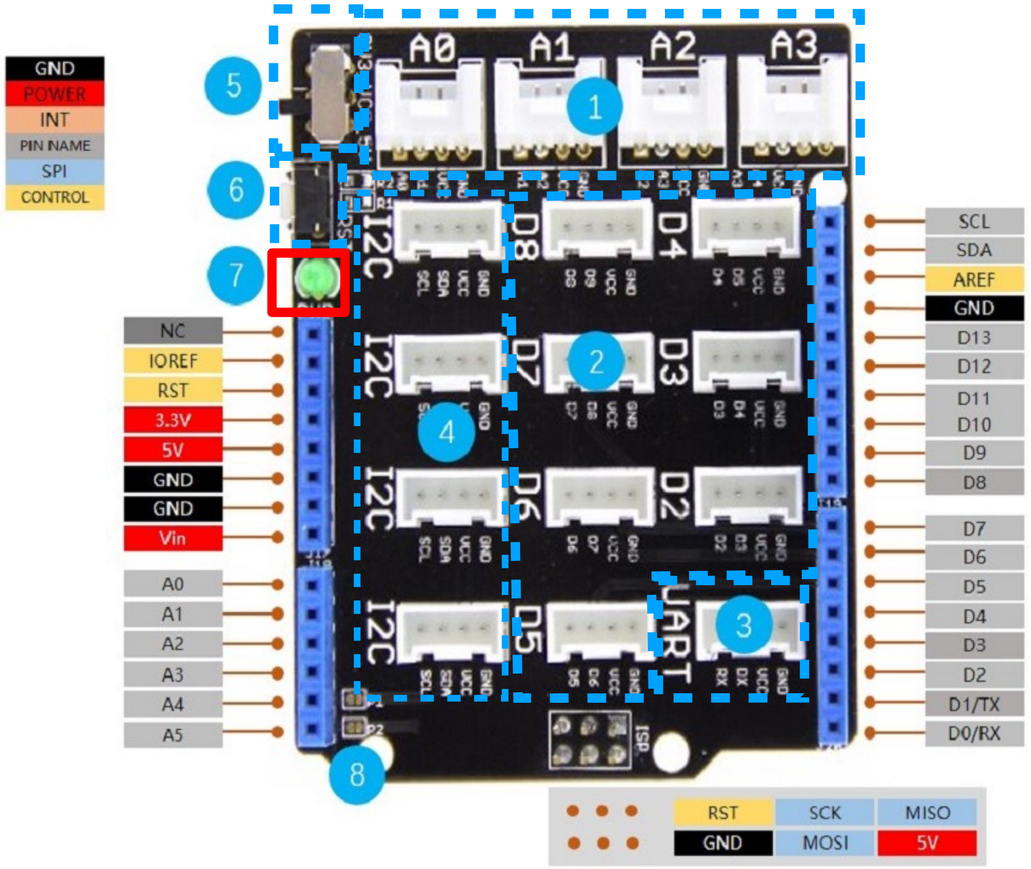
Base Shield

6-Reset Button: reset the Arduino board.



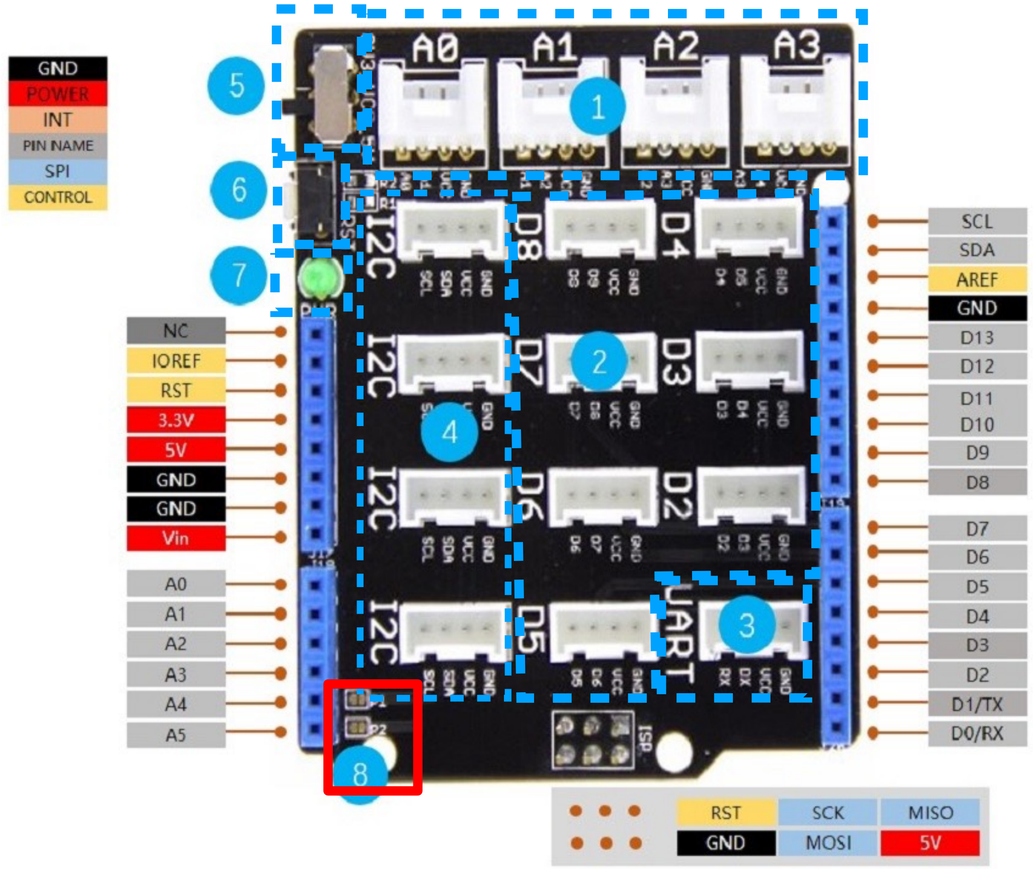
Base Shield

7-PWR LED：The Green LED turns on when power on.



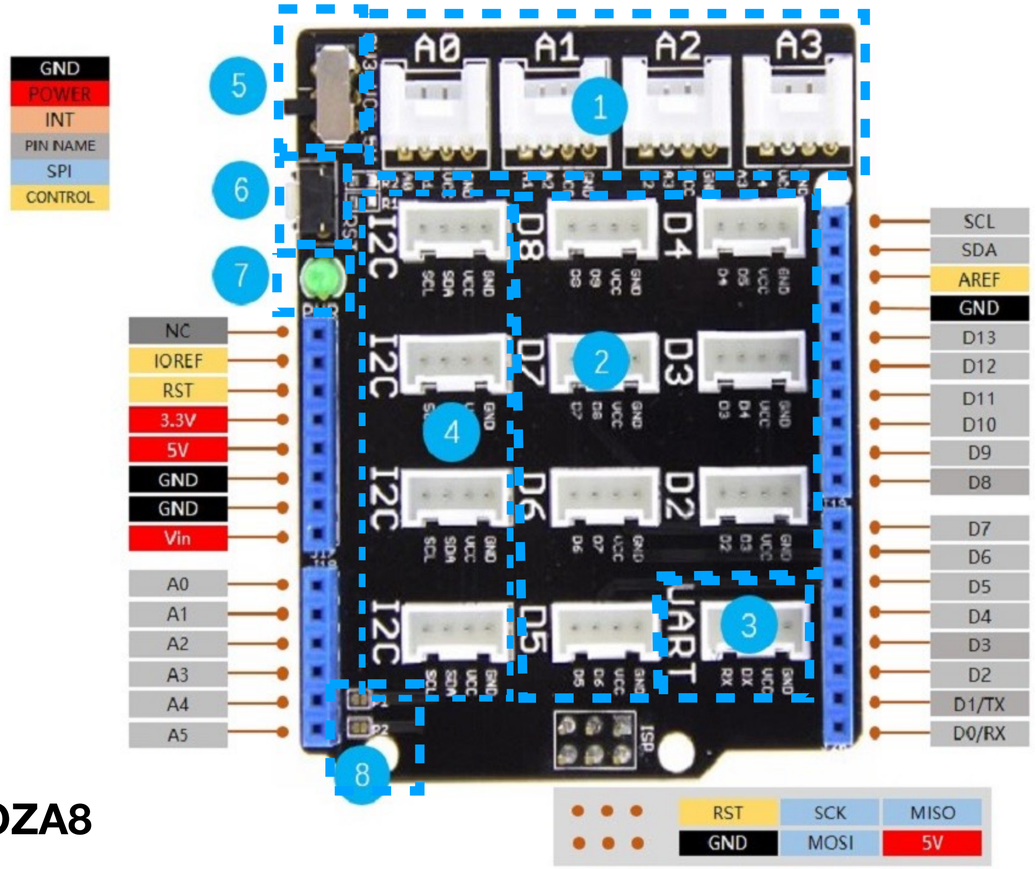
Base Shield

8-P1, P2：please solder the pads P1 and P2，
if use Base Shield v2 with Seeeduino V3.



Base Shield

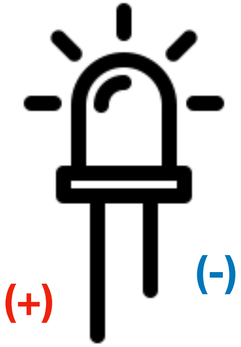
8-P1, P2：please solder the pads P1 and P2，
if use Base Shield v2 with Seeeduino V3.



https://bit.ly/2ogOZA8

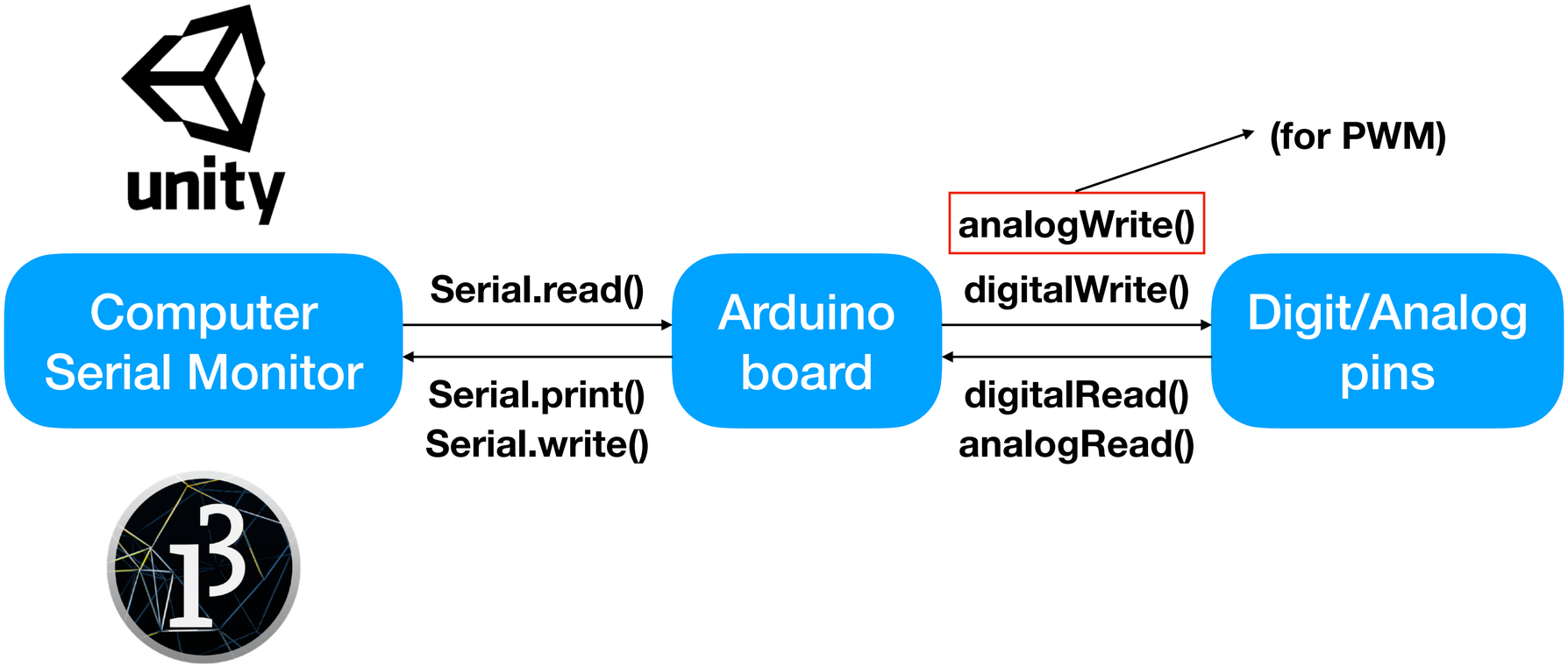
LED

Grove-Red LED —> D3



[https://bit.ly/2oe7JAi]

Arduino I/O


unity
Computer
Serial Monitor
Serial.read()
Serial.print()
Serial.write()
Arduino
board
analogWrite()
(for PWM)
digitalWrite()
digitalRead()
analogRead()
Digit/Analog
pins

LED

```
// as the topic, we will use Grove - Led to make a breath light
// Grove - LED connect to D3
// the following pin which support PWM can be used:
// 3, 5, 6, 9, 10, 11

const int pinLed    = 3;                        // pin of led define here

void setup()
{
    pinMode(pinLed, OUTPUT);                    // set led OUTPUT
}

void loop()
{

    for(int i=0; i<256; i++)
    {
        analogWrite(pinLed, i);
        delay(5);                               // change delay time can breath faster or slower
    }
    delay(100);

    for(int i=254; i>=0; i--)
    {
        analogWrite(pinLed, i);
        delay(5);                               // change delay time can breath faster or slower
    }
    delay(500);
}
```

https://bit.ly/2ohp37q

LED

```
// as the topic, we will use Grove - Led to make a breath light
// Grove - LED connect to D3
// the following pin which support PWM can be used:
// 3, 5, 6, 9, 10, 11

const int pinLed    = 3;                        // pin of led define here

void setup()
{
    pinMode(pinLed, OUTPUT);                    // set led OUTPUT
}

void loop()
{

    for(int i=0; i<256; i++)
    {
        analogWrite(pinLed, i);
        delay(5);                               // change delay time can breath faster or slower
    }
    delay(100);

    for(int i=254; i>=0; i--)
    {
        analogWrite(pinLed, i);
        delay(5);                               // change delay time can breath faster or slower
    }
    delay(500);
}
```

LED

```
// as the topic, we will use Grove - Led to make a breath light
// Grove - LED connect to D3
// the following pin which support PWM can be used:
// 3, 5, 6, 9, 10, 11

const int pinLed    = 3;                        // pin of led define here

void setup()
{
    pinMode(pinLed, OUTPUT);                    // set led OUTPUT
}

void loop()
{

    for(int i=0; i<256; i++)
    {
        analogWrite(pinLed, i);
        delay(5);                               // change delay time can breath faster or slower
    }
    delay(100);

    for(int i=254; i>=0; i--)
    {
        analogWrite(pinLed, i);
        delay(5);                               // change delay time can breath faster or slower
    }
    delay(500);
}
```

LED

```
// as the topic, we will use Grove - Led to make a breath light
// Grove - LED connect to D3
// the following pin which support PWM can be used:
// 3, 5, 6, 9, 10, 11

const int pinLed    = 3;                        // pin of led define here

void setup()
{
    pinMode(pinLed, OUTPUT);                    // set led OUTPUT
}

void loop()
{

    for(int i=0; i<256; i++)
    {
        analogWrite(pinLed, i);
        delay(5);                               // change delay time can breath faster or slower
    }
    delay(100);

    for(int i=254; i>=0; i--)
    {
        analogWrite(pinLed, i);
        delay(5);                               // change delay time can breath faster or slower
    }
    delay(500);
}
```

0 ==> 255

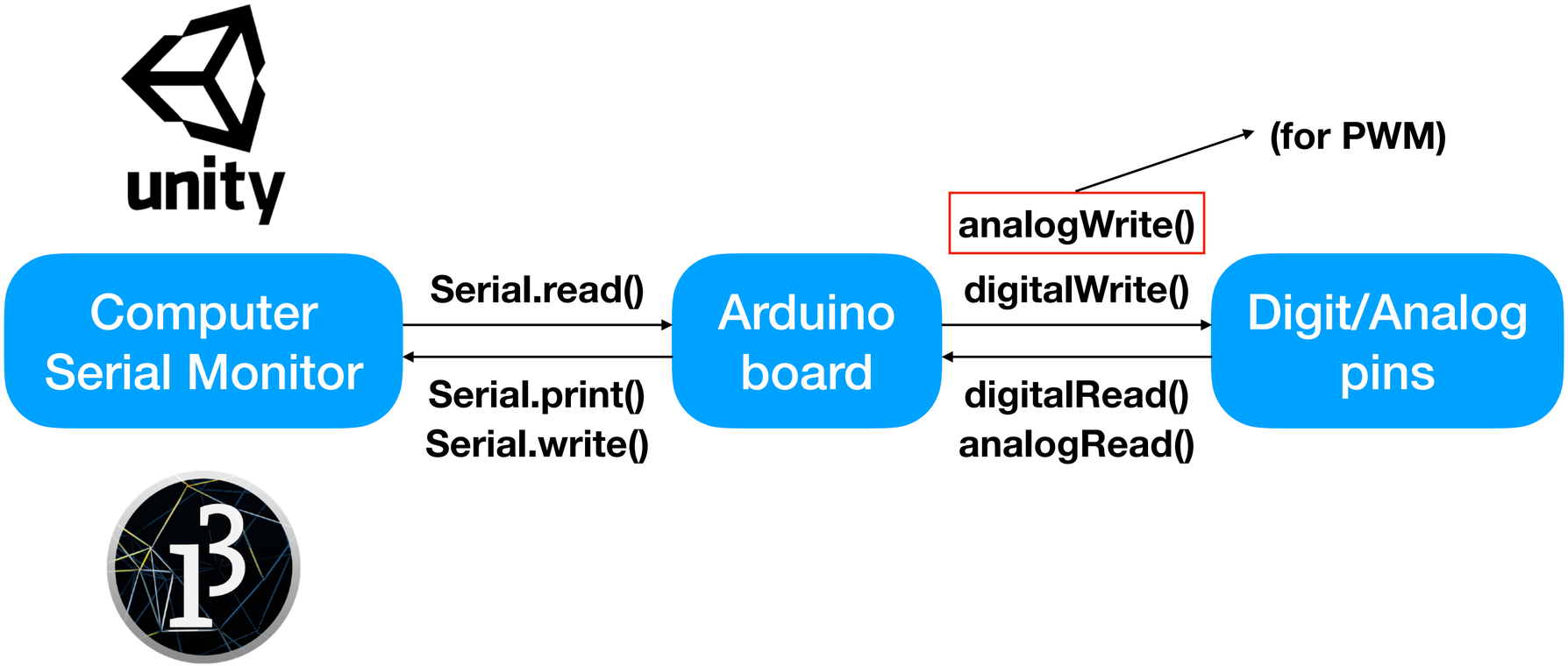
255 ==> 0

Button

Button —> D3

LED —> D7

Arduino I/O


unity
Computer
Serial Monitor
Serial.read()
Serial.print()
Serial.write()
Arduino
board
analogWrite()
(for PWM)
digitalWrite()
digitalRead()
analogRead()
Digit/Analog
pins

Button

```
// when the button was pressed, the led will on
// otherwise led off
// Grove - Button connect to D3
// Grove - LED connect to D7

const int pinButton = 3;                    // pin of button define here
const int pinLed    = 7;                    // pin of led define here

void setup()
{
    pinMode(pinButton, INPUT);              // set button INPUT
    pinMode(pinLed, OUTPUT);                // set led OUTPUT
}

void loop()
{
    if(digitalRead(pinButton))                 // when button is pressed
    {
        digitalWrite(pinLed, HIGH);         // led on
    }
    else
    {
        digitalWrite(pinLed, LOW);
    }

    delay(10);
}
```

https://bit.ly/2ocpWye

Button

```
// when the button was pressed, the led will on
// otherwise led off
// Grove - Button connect to D3
// Grove - LED connect to D7

const int pinButton = 3;                    // pin of button define here
const int pinLed    = 7;                    // pin of led define here

void setup()
{
    pinMode(pinButton, INPUT);              // set button INPUT
    pinMode(pinLed, OUTPUT);                // set led OUTPUT
}

void loop()
{
    if(digitalRead(pinButton))                  // when button is pressed
    {
        digitalWrite(pinLed, HIGH);             // led on
    }
    else
    {
        digitalWrite(pinLed, LOW);
    }

    delay(10);
}
```

Button

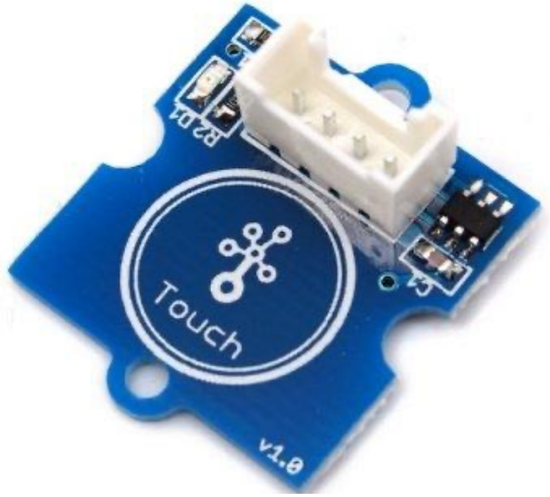
```
// when the button was pressed, the led will on
// otherwise led off
// Grove - Button connect to D3
// Grove - LED connect to D7

const int pinButton = 3;                    // pin of button define here
const int pinLed    = 7;                    // pin of led define here

void setup()
{
    pinMode(pinButton, INPUT);              // set button INPUT
    pinMode(pinLed, OUTPUT);                // set led OUTPUT
}

void loop()
{
    if(digitalRead(pinButton))                  // when button is pressed
    {
        digitalWrite(pinLed, HIGH);             // led on
    }
    else
    {
        digitalWrite(pinLed, LOW);
    }

    delay(10);
}
```

Button

```
// when the button was pressed, the led will on
// otherwise led off
// Grove - Button connect to D3
// Grove - LED connect to D7

const int pinButton = 3;                    // pin of button define here
const int pinLed    = 7;                    // pin of led define here

void setup()
{
    pinMode(pinButton, INPUT);              // set button INPUT
    pinMode(pinLed, OUTPUT);                // set led OUTPUT
}

void loop()
{
    if(digitalRead(pinButton))                  // when button is pressed
    {
        digitalWrite(pinLed, HIGH);             // led on
    }
    else
    {
        digitalWrite(pinLed, LOW);
    }

    delay(10);
}
```

Touch

Touch —> D3



LED —> D7

The same as button.

Button + Touch

Button —> turn the LED on/off
Touch —> switch the LED patterns

Button + Touch

Button —> turn the LED on/off
Touch —> switch the LED patterns

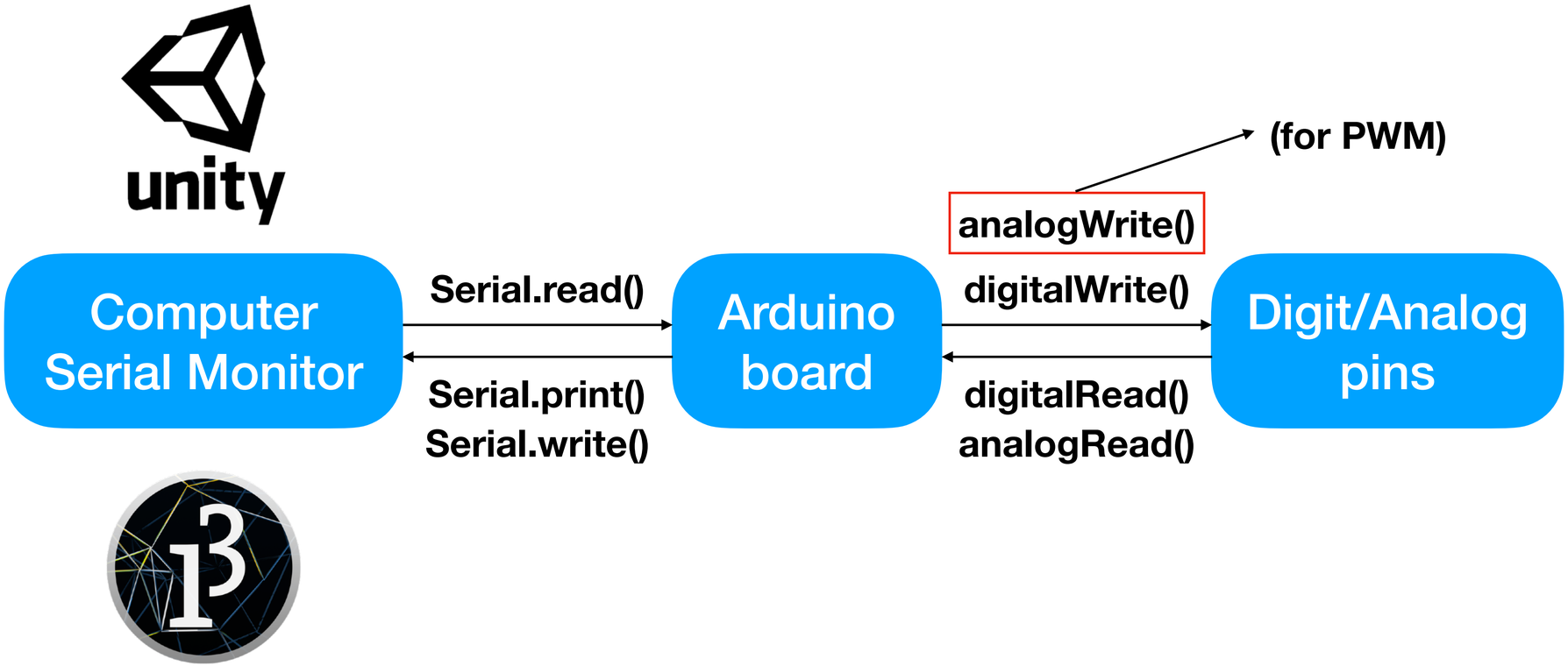
https://bit.ly/2oI4aD7

Light Sensor

Light sensor —> A0

LED —> D3

Arduino I/O


unity
Computer
Serial Monitor
Serial.read()
Serial.print()
Serial.write()
Arduino
board
analogWrite()
(for PWM)
digitalWrite()
digitalRead()
analogRead()
Digit/Analog
pins

Light Sensor

```
const int pinLight = A0;
const int pinLed   = 3;

int thresholdvalue=400;                 //the threshold to turn on or off the LED

void setup()
{
    Serial.begin(9600);
    pinMode(pinLed, OUTPUT);
}

void loop()
{
    int sensorValue = analogRead(pinLight);    //the light sensor is attached to analog 0
    if(sensorValue<thresholdvalue)
    {
        digitalWrite(pinLed, HIGH);
    }
    else
    {
        digitalWrite(pinLed, LOW);
    }
    Serial.println(sensorValue);
    delay(100);
}
```

https://bit.ly/2OvZxXa

Light Sensor

How about analog?

The darker the light sensor,
the brighter the LED.

Light Sensor

```
const int pinLight = A0;
const int pinLed   = 3;

void setup()
{

      Serial.begin(9600);
      pinMode(pinLed, OUTPUT);
}

void loop()
{
    int sensorValue = analogRead(pinLight);

    analogWrite(pinLed, map(sensorValue,0,760,255,0));

    Serial.println(sensorValue);
    delay(100);
}
```

https://bit.ly/2Mj5Yu4

Rotary Angle Sensor

Rotary Angle Sensor —> A0

LED —> D3

Rotary Angle Sensor

```
// demo of Starter Kit V2.0


const int potentiometer = A0;                    // rotary angle sensor connect to A0

void setup()
{
    Serial.begin(9600);                         // set the serial communication frequency at 9600 bits per sec
    pinMode(potentiometer, INPUT);
}

void loop()
{
    int value = analogRead(potentiometer);
    Serial.println(value);                      // pirnt the value on the serial monitor screen
    delay(100);                                  // wait 1000ms before printing next value
}
```

https://bit.ly/2oZG9Y4

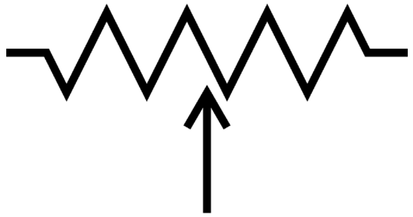
Rotary Angle Sensor

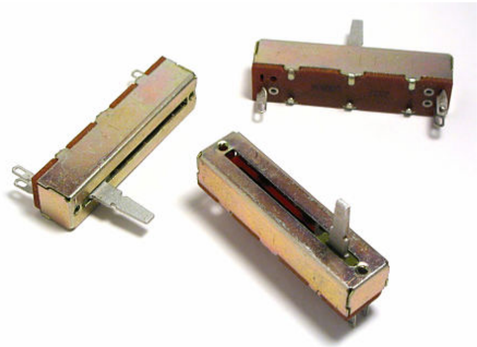
```
// demo of Starter Kit V2.0

                                                          for analog pin
const int potentiometer = A0;                    // rotary angle sensor connect to A0

void setup()
{
    Serial.begin(9600);                          // set the serial communication frequency at 9600 bits per sec
    pinMode(potentiometer, INPUT);
}

void loop()
{
    int value = analogRead(potentiometer);
    Serial.println(value);                       // pirnt the value on the serial monitor screen
    delay(100);                                   // wait 1000ms before printing next value
}
```

Rotary Angle Sensor

Potentiometer (電位器) = Variable resistor (可變電阻)

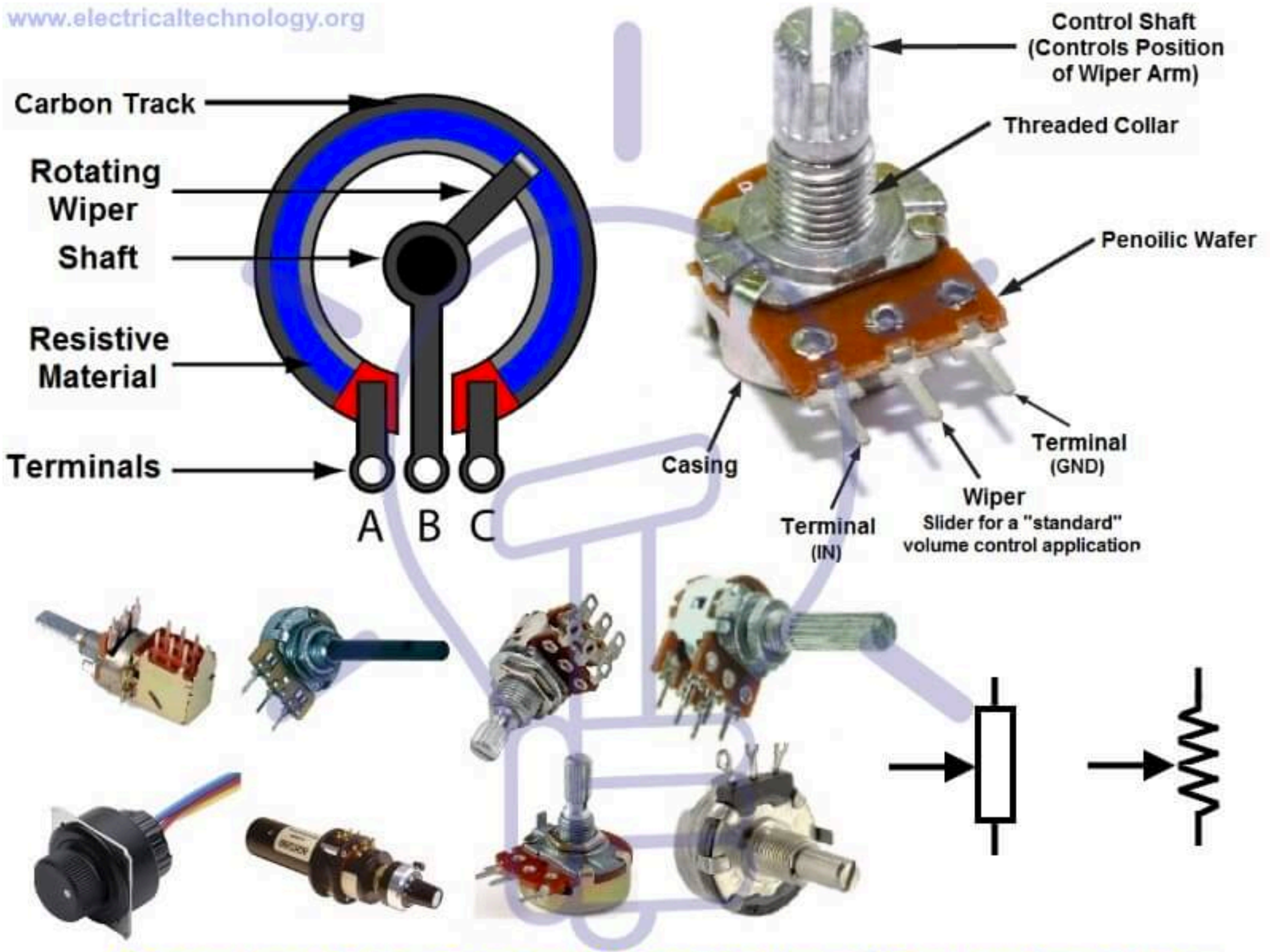
Single-turn potentiometer





Linear taper potentiometer

[Wiki]



[https://bit.ly/2LVPdpl]

Rotary Angle Sensor

```
// demo of Starter Kit V2.0

                                                          for analog pin
const int potentiometer = A0;                          // rotary angle sensor connect to A0

void setup()
{
    Serial.begin(9600);                               // set the serial communication frequency at 9600 bits per sec
    pinMode(potentiometer, INPUT);
}

void loop()
{
    int value = analogRead(potentiometer);
    Serial.println(value);                            // pirnt the value on the serial monitor screen
    delay(100);                                        // wait 1000ms before printing next value
}
```

Rotary Angle Sensor

```
// demo of Starter Kit V2.0

const int potentiometer = A0;                    // rotary angle sensor connect to A0

void setup()
{
    Serial.begin(9600);                          // set the serial communication frequency at 9600 bits per sec
    pinMode(potentiometer, INPUT);
}

void loop()
{
    int value = analogRead(potentiometer);
    Serial.println(value);                       // pirnt the value on the serial monitor screen
    delay(100);                                   // wait 1000ms before printing next value
}
```

for analog pin

0~1023

Rotary Angle Sensor

```
// demo of Starter Kit V2.0


const int potentiometer = A0;                    // rotary angle sensor connect to A0
const int pinLed = 3;

void setup()
{
    Serial.begin(9600);                          // set the serial communication frequency at 9600 bits per sec
    pinMode(potentiometer, INPUT);
    pinMode(pinLed, OUTPUT);


void loop()
{
    int value = analogRead(potentiometer);
    analogWrite(pinLed, map(value,0,1024,0,255));

    Serial.println(value);                       // pirnt the value on the serial monitor screen
    delay(100);                                   // wait 1000ms before printing next value
}
```

map from one range to another

https://bit.ly/33dK568

LED

```
// as the topic, we will use Grove - Led to make a breath light
// Grove - LED connect to D3
// the following pin which support PWM can be used:
// 3, 5, 6, 9, 10, 11

const int pinLed    = 3;                    // pin of led define here

void setup()
{
    pinMode(pinLed, OUTPUT);                // set led OUTPUT
}

void loop()
{

    for(int i=0; i<256; i++)
    {
        analogWrite(pinLed, i);
        delay(5);                           // change delay time can breath faster or slower
    }
    delay(100);

    for(int i=254; i>=0; i--)
    {
        analogWrite(pinLed, i);
        delay(5);                           // change delay time can breath faster or slower
    }
    delay(500);
}
```

0 ==> 255

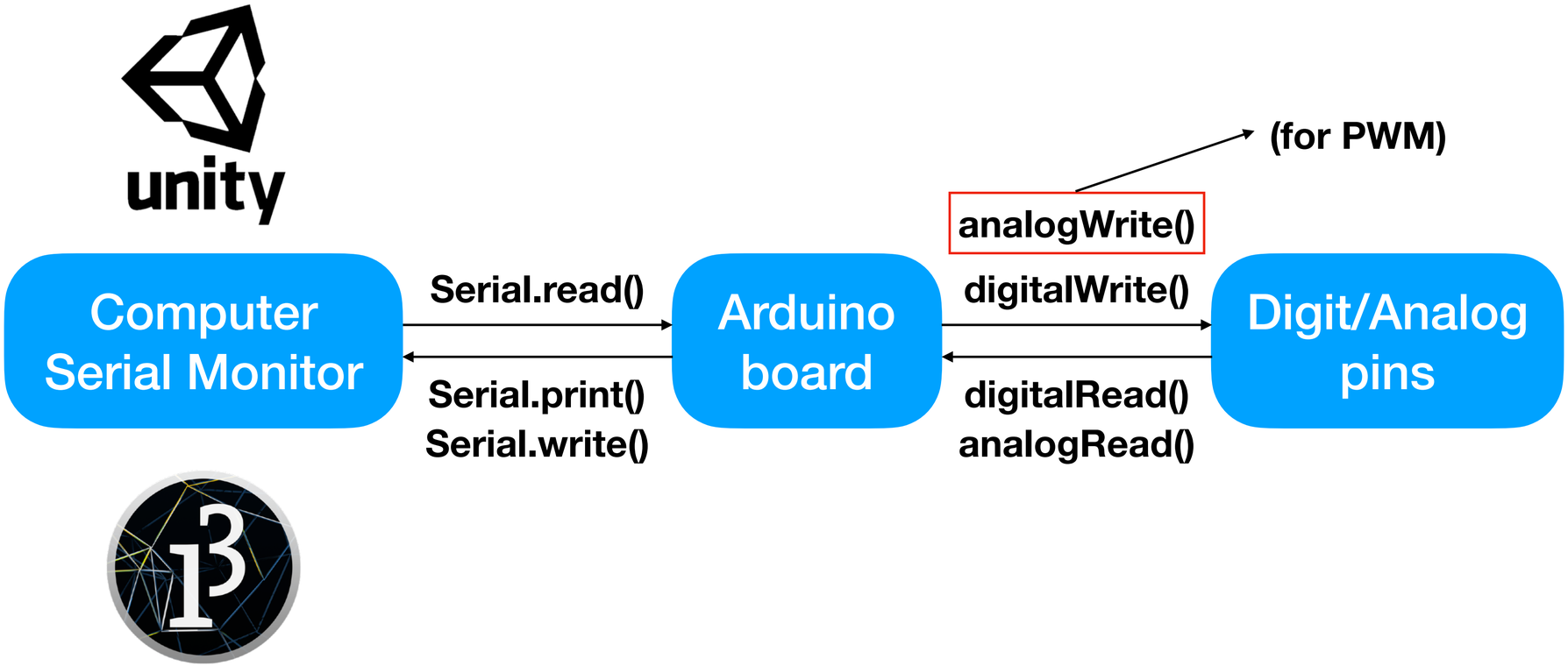
255 ==> 0

Rotary Angle Sensor

Safe dial

Set the code 4 digits (0~9)
If the code is correct
—> “Open the safe”, turn the LED on
If the code is incorrect
—> the LED blinks

Arduino I/O


unity
Computer
Serial Monitor
Serial.read()
Serial.print()
Serial.write()
Arduino
board
analogWrite()
(for PWM)
digitalWrite()
digitalRead()
analogRead()
Digit/Analog
pins

Sound Sensor

Sound sensor —> A0

LED —> D7

Sound Sensor

Loud sound —> turn the LED on

Sound Sensor

```
const int pinSound = A0;                // pin of Sound Sensor
const int pinLed   = 7;                 // pin of LED

int thresholdValue = 500;                  // the threshold to turn on or off the LED

void setup()
{
    pinMode(pinLed, OUTPUT);             //set the LED on Digital 12 as an OUTPUT
}

void loop()
{
    int sensorValue = analogRead(pinSound);   //read the sensorValue on Analog 0
    if(sensorValue>thresholdValue)
    digitalWrite(pinLed,HIGH);
    delay(200);
    digitalWrite(pinLed,LOW);
}
```

https://bit.ly/30T21Bv

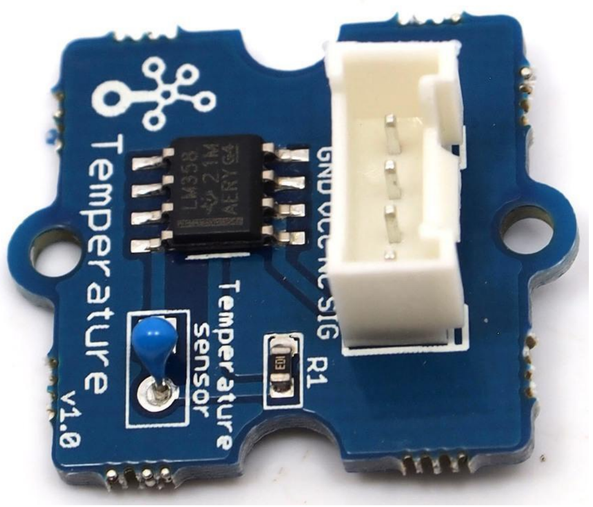
Sound Sensor

Loud sound —> turn the LED on

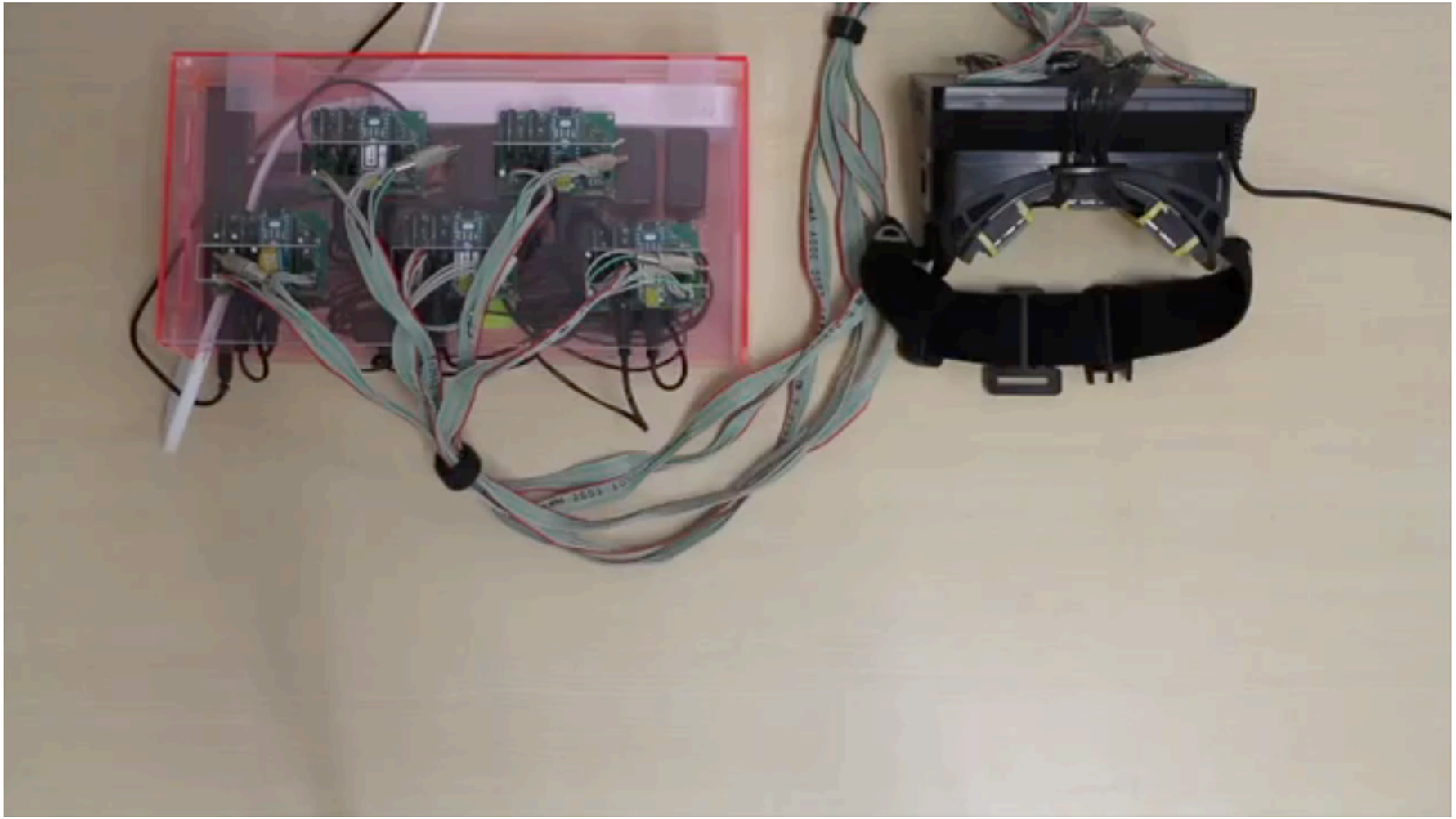
The louder the sound,
the brighter the LED.

Temperature Sensor

Temperature sensor —> A0



Temperature Sensor



ThermoVR, CHI'17

Temperature Sensor

Ambiotherm, CHI'17

Temperature Sensor

AoEs, SIGGPRAH'17 ET

Temperature Sensor

```
// demo of Starter Kit V2.0 - Grove Temperature Sensor
//

const int pinTemp = A0;       // pin of temperature sensor

float temperature;
int B=3975;                   // B value of the thermistor
float resistance;

void setup()
{
    Serial.begin(9600);     //Baud rate for the serial communication of Arduino
    pinMode(A0,INPUT);      //Setting the A0 pin as input pin to take data from the temperature sensor

}

void loop()
{
    int val = analogRead(pinTemp);                                  // get analog value
    resistance=(float)(1023-val)*10000/val;                         // get resistance
    temperature=1/(log(resistance/10000)/B+1/298.15)-273.15;        // calc temperature
    Serial.println(temperature);

    delay(1000);          // delay 1s
}
```

https://bit.ly/335Cbfc

Temperature Sensor

```
// demo of Starter Kit V2.0 - Grove Temperature Sensor
//

const int pinTemp = A0;       // pin of temperature sensor

float temperature;
int B=3975;                   // B value of the thermistor
float resistance;

void setup()
{
    Serial.begin(9600);     //Baud rate for the serial communication of Arduino
    pinMode(A0,INPUT);      //Setting the A0 pin as input pin to take data from the temperature sensor

}

void loop()
{
    int val = analogRead(pinTemp);                              // get analog value
    resistance=(float)(1023-val)*10000/val;                     // get resistance
    temperature=1/(log(resistance/10000)/B+1/298.15)-273.15;    // calc temperature
    Serial.println(temperature);

    delay(1000);          // delay 1s
}
```

Temperature Sensor

```
// demo of Starter Kit V2.0 - Grove Temperature Sensor
//

const int pinTemp = A0;       // pin of temperature sensor

float temperature;
int B=3975;                   // B value of the thermistor
float resistance;

void setup()
{
    Serial.begin(9600);     //Baud rate for the serial communication of Arduino
    pinMode(A0,INPUT);      //Setting the A0 pin as input pin to take data from the temperature sensor

}

void loop()
{
    int val = analogRead(pinTemp);                              // get analog value
    resistance=(float)(1023-val)*10000/val;                     // get resistance
    temperature=1/(log(resistance/10000)/B+1/298.15)-273.15;    // calc temperature
    Serial.println(temperature);

    delay(1000);          // delay 1s
}
```

Temperature Sensor

```
// demo of Starter Kit V2.0 - Grove Temperature Sensor
//

const int pinTemp = A0;       // pin of temperature sensor

float temperature;
int B=3975;                   // B value of the thermistor
float resistance;

void setup()
{
    Serial.begin(9600);      //Baud rate for the serial communication of Arduino
    pinMode(A0,INPUT);       //Setting the A0 pin as input pin to take data from the temperature sensor

}

void loop()
{
    int val = analogRead(pinTemp);                              // get analog value
    resistance=(float)(1023-val)*10000/val;                     // get resistance
    temperature=1/(log(resistance/10000)/B+1/298.15)-273.15;    // calc temperature
    Serial.println(temperature);

    delay(1000);          // delay 1s
}
```