

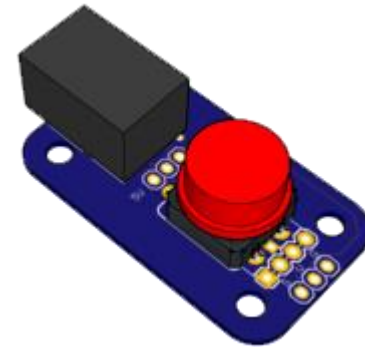
TScratch Basics

Coding with Arduino IDE (Software)

Learning Objective

In this lesson you will learn:

TScratch (TSense Button)



- Include a physical input into your project!
- Coding an Digital input with Arduino

Conditions Coding

What are conditions?

- IF – ELSE
- Example

If the last school bell rings, what would you do?

- a) Stay in class
- b) Go home

Coding condition in Arduino

```
void loop() {  
    // put your main code here, to run repeatedly:  
    if (LastBell==True){  
        GoHome()  
    }  
    else{  
        wait()  
    }  
  
}
```

Write your first control program

- Define the following in the declaration space
 1. Define BUTTON as pin 3
 2. Define LED as pin 12
 3. A variable named “buttonstate” to store the state of the button

Note: Comments appear after // or within /***/

```
TScratch2_Button
/**
 * Program name : TScratch2_Button
 * Description  : This program turns the led on when the button is pressed and
 *               off when the button is released.
 */
#define BUTTON_PIN 3           //Defines pin of button as a constant
#define LED_PIN 12            //Defines pin of led as a constant
int buttonstate = 0;         //Declares a integer variable to store the state of the button
```

Write your first control program

- Declare the type of input/output in the setup
 1. BUTTON → INPUT
 2. LED → OUTPUT

```
void setup() {  
  pinMode(BUTTON_PIN, INPUT);           //Initializes the button as an INPUT  
  pinMode(LED_PIN, OUTPUT);             //Initializes the led as an OUTPUT  
}
```

Write your first control program

- Lastly use conditional programming in the loop() function
if the button is pressed, the LED will switch on,
else it will switch off

```
void loop() {  
  buttonstate = digitalRead(BUTTON_PIN); //Reads button and stores its state in the buttonstate variable  
  if (buttonstate == HIGH) {             //Checks if the value of digitalstate is HIGH  
    digitalWrite(LED_PIN, HIGH);        //Turns the led on  
  }  
  else {                                  //If the value of digitalstate is not HIGH i.e. LOW  
    digitalWrite(LED_PIN, LOW);        //Turns the led off  
  }  
}
```

Complete Program

```

#define  BUTTON_PIN 3           //Defines pin of button as a constant
#define  LED_PIN 12           //Defines pin of led as a constant
int  buttonstate = 0;         //Declares a integer variable to store the state of the button

void  setup()  {
    pinMode(BUTTON_PIN, INPUT); //Initializes the button as an INPUT
    pinMode(LED_PIN, OUTPUT);   //Initializes the led as an OUTPUT
}

void  loop()  {
    buttonstate = digitalRead(BUTTON_PIN); //Reads button and stores its state in the buttonstate variable
    if (buttonstate == HIGH) {           //Checks if the value of digitalstate is HIGH
        digitalWrite(LED_PIN, HIGH);    //Turns the led on
    }
    else {                               //If the value of digitalstate is not HIGH i.e. LOW
        digitalWrite(LED_PIN, LOW);     //Turns the led off
    }
}

```


Try it yourself!

Control a blinking LED!

- Make the LED blink when the button is pressed
- When the button is released, switch off the LED.

Solution – Control blinking LED

```
#define  BUTTON_PIN 3
#define  LED_PIN 12

void setup() {
  pinMode(LED_PIN, OUTPUT);
  pinMode(BUTTON_PIN, INPUT);
}

void loop() {
  if (button == HIGH) {
    digitalWrite(LED_PIN, HIGH); // turn the led on (HIGH is the voltage level)
    delay(1000);                // wait for a second
    digitalWrite(LED_PIN, LOW); // turn the led off by making the voltage LOW
    delay(1000);                // wait for a second
  }
  else {
    digitalWrite(LED_PIN, LOW);
  }
}
```