Experiment 5 – Collision check

Instruction

Do you know there is a collision sensor inside the car? It is used to detect collisions to make sure the car can open airbag immediately and alarming after the impact. In this experiment, let's make a collision detector to simply simulate the process of automobile collision detection.

Target

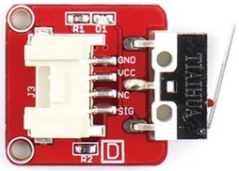
- Learn how the collision sensor work and use it to make a collision detector with buzzer.

Required Parts

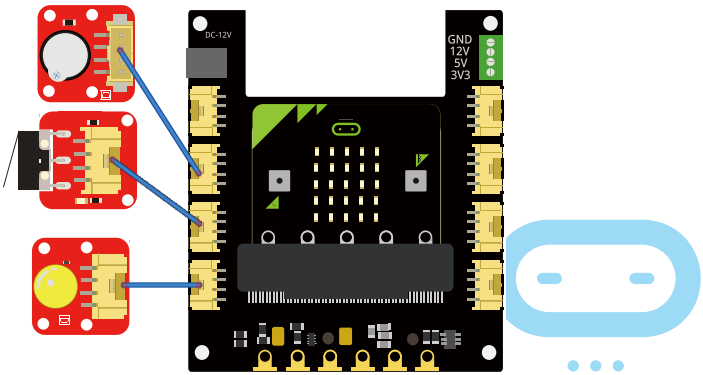
- Micro:bit x1
- Crowtail-Base shield for Micro:bit x1
- Crowtail-Collision Sensor x1
- Crowtail-Buzzer x1
- Crowtail-LED(Yellow) x1
- Crowtail-Cable x3
- USB cable x1

Hardware learning and connection

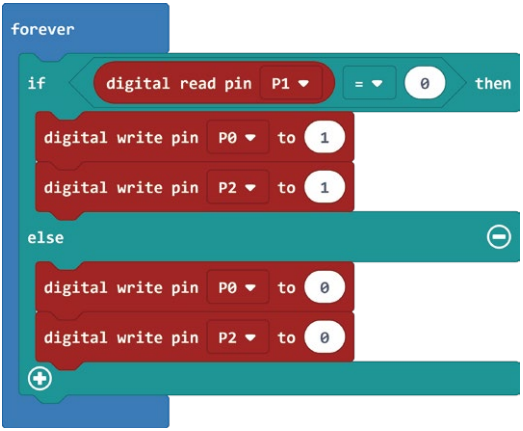
This is a robot model car crashes or collision switch sensor module, it usually outputs a logic HIGH signal, but when the sensor crash something such as the wall, the on-board switch will be pressed, and the module outputs a logic LOW signal. This module can be installed into any mobile platform to achieve collision detection function via 4 pin sensor cable and Micro:bit sensor expansion board connector.



Connect the Crowtail-Collision Sensor, Crowtail-LED and Crowtail-Buzzer to P1, P0 and P2 ports of Crowtail-Base shield for Micro:bit. The hardware connections are as follows:



Programming and note



- **If/else:** The **If/else** block is a logical structure. If the logical statement that is attached to it (digital read P1 = 0) is true, then it will execute the code blocks inside of the if. If that statement is false, it will execute the **else** blocks. In this case, if the statement is true(the value is digital read from P1 port equal to 0, note that it will output a logic LOW signal when the collision sensor is crashed), then turn on the LED and buzzer on P0 and P2; else, turn off the LED and buzzer on P0 and P2.

- **Digital Write:** There are two modules we need to use the **digital write** block to set they output 1(logic HIGH signal) or 0(logic LOW signal). Here, we set the LED and buzzer output to 1 when the collision sensor detect a collision, otherwise, set it to 0.

- **Download the program to micro:bit to see what happens.**

Result

When the on-board switch of the collision sensor is pressed, LED will light on and the buzzer will make a big beep noise to remind collision to occur, otherwise, LED will light off and buzzer stop work.

The car can detect a collision, but how the car detects the obstacle to prevent a crash?