Experiment 18 – Smart music box

Instruction

Have you ever seen a robot that says hello when someone approaches? That is a very interesting thing, so let's do a similar project in this lesson, put it in a box and make a fun and smart music box!

Target

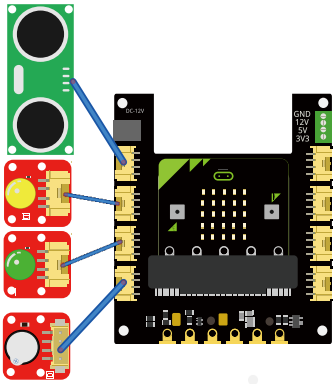
- Use the modules and programming knowledge we have learned to make a smart music box.
- Learn how to stop the buzzer melody.

Required Parts

- Micro:bit x1
- Crowtail-Base shield for Micro:bit x1
- Crowtail-Ultrasonic Ranging Sensor x1
- Crowtail-Buzzer x1
- Crowtail-LED(Green) x1
- Crowtail-LED(Yellow) x1
- Crowtail-Cable x4
- USB cable x1

Hardware learning and connection

Connect Crowtail-Ultrasonic Ranging Sensor to P13&P15 port of Crowtail-Base shield for Micro:bit. Connect Crowtail-Buzzer, Crowtail-LED(Green) and Crowtail-LED (Yellow) to P0, P1 and P2 ports of Crowtail-Base shield for Micro:bit. The hardware connection are as follows:



Programming and note

- **Stop melody all:** Stop playing a musical melody. We can use this block to stop melodies that are played either in the foreground or background. In this case, if the value of dis more than 10, we use this block to stop melody immediately.

- **Blocks overview**

  1. Add extension package for the ultrasonic ranging sensor.
  2. Set a variable named dis to store the distance detected by the ultrasonic ranging sensor.
  3. Read the distance in cm from ultrasonic and store in dis.
  4. If the value of "dis" less than 10, show "heart" icon on matrix LEDs, play a melody and turn two LEDs on.

5. If the value of dis more than 10, clear the matrix LEDs, stop melody and turn two LEDs off.
6. Loop in forever block.

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

Result

When the distance detected by the ultrasonic sensor is less than 10cm, the matrix LEDs on the micro: bit will display a heart icon, the buzzer will play the melody, and two LEDs will light up. When the ultrasonic sensor detects a distance greater than 10cm, the micro: bit will clear the matrix LEDs display, immediately stop the buzzer to play the melody and turn off the two LEDs.

How can we use this project to make our own songs to welcome others or pranks?

Experiment 19 – Remote control fan

Instruction

When summer comes, you will find it great and convenient to have a remote control fan. With it, we no longer need to manually turn on and off the fans, especially when you are too hot to want to move. When you finish this experiment, you will get your own mini micro: bit remote fan! Let's get started.

Target

- Make your own mini remote control fan.

Required Parts

- Micro:bit x1
- Crowtail-Base shield for Micro:bit x1
- Crowtail-IR Receiver x1
- Crowtail-Relay x1
- Crowtail-Cable x2
- Infrared Remote Control x1
- DC Motor x1
- USB cable x1
- Jumper Wire x1

Hardware learning and connection

Connect Crowtail-IR Receiver to P16 port of Crowtail-Base shield for Micro:bit. Connect Crowtail-Relay to P8 port of Crowtail-Base shield for Micro:bit. Loosen the screws of the relay, connect one end of the jumper to the 3V3 port of the Base Shield and the other end of the jumper to the COM port of the Relay. Connect the two wires of the motor to the NO port of the relay and the GND port of the Base Shield. ***Note that the power consumed by the motor is large,***