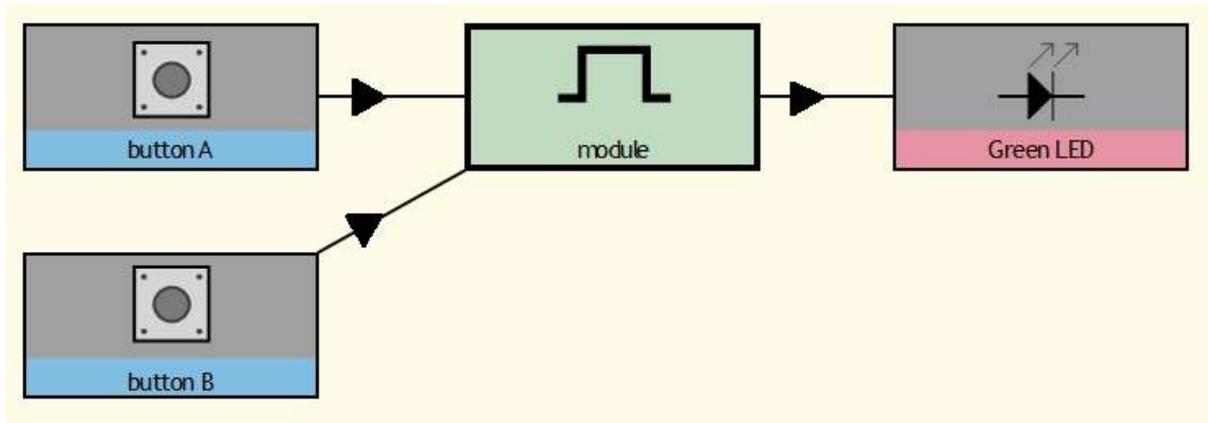


Discovery Kit Experiment 1 - LED Control Circuit

An LED (Light-emitting diode) always requires a current limiting resistor in series and the correct polarity of the connections is important: positive (long leg) to P0 and negative (short leg/flat side) to GND. The micro:bit buttons are used to switch the LED current on and off.

In the Mr Bit control system, the control module contains the program which appears in the text space at the top of the screen.

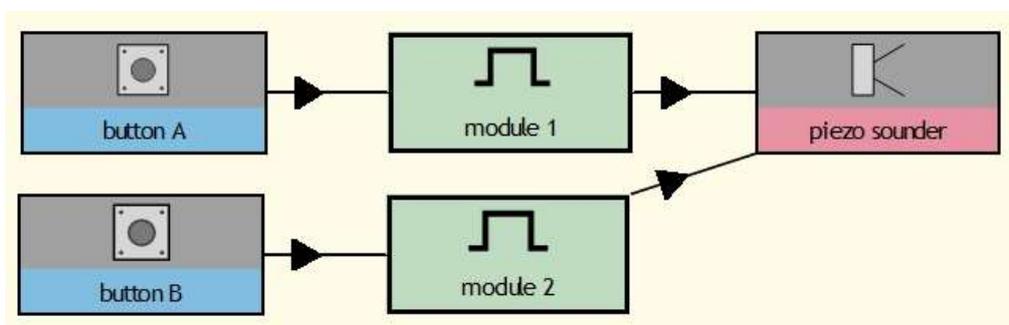


```
Program Script
module
When button A gets pressed, switch on the Green LED until button B gets pressed.
```

Discovery Kit Experiment 2 - Buzzer Jukebox

A piezo sounder contains a crystal which vibrates when a pulsing electric current is sent to it. The vibration can be heard as an audible sound. In this experiment when button A is pressed, pulses are produced at a fixed frequency which sounds as a simple steady tone. When button B is pressed, a series of stored frequencies is used to sound as a tune.

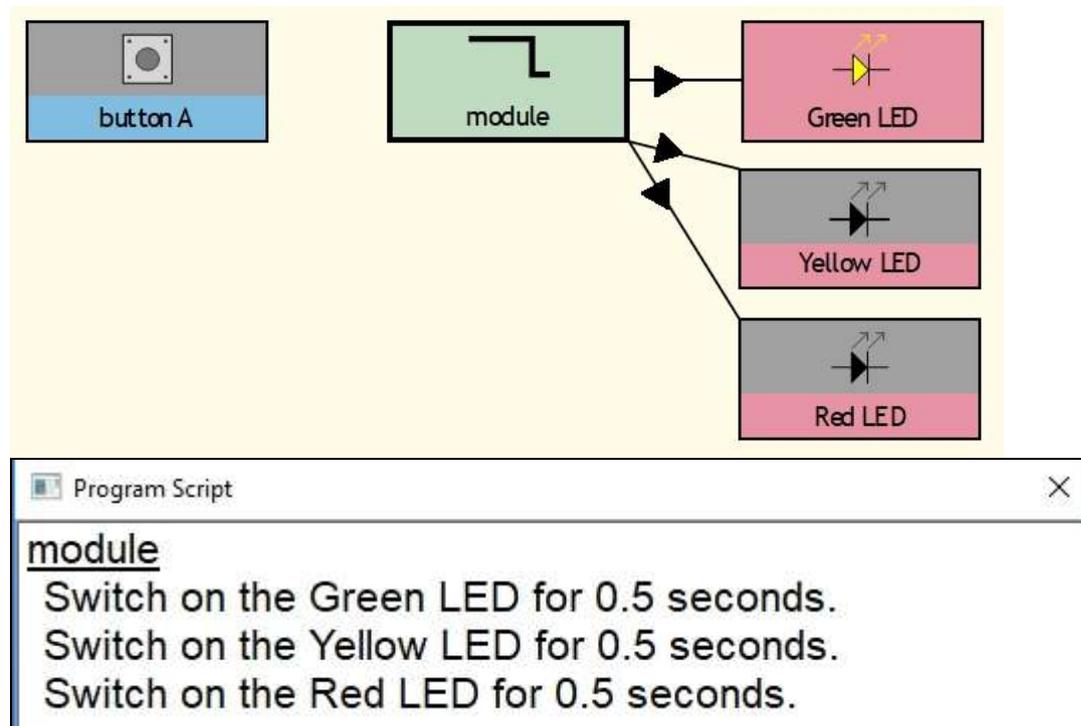
In the Mr Bit control system, the piezo sounder is linked to a control module which contains a music editor which can be seen in Design mode when you link the OUTPUTS tab to the sounder.



```
Program Script
While button A is pressed, play "Tone" on the piezo sounder.
While button B is pressed, play "Hornpipe" on the piezo sounder.
```

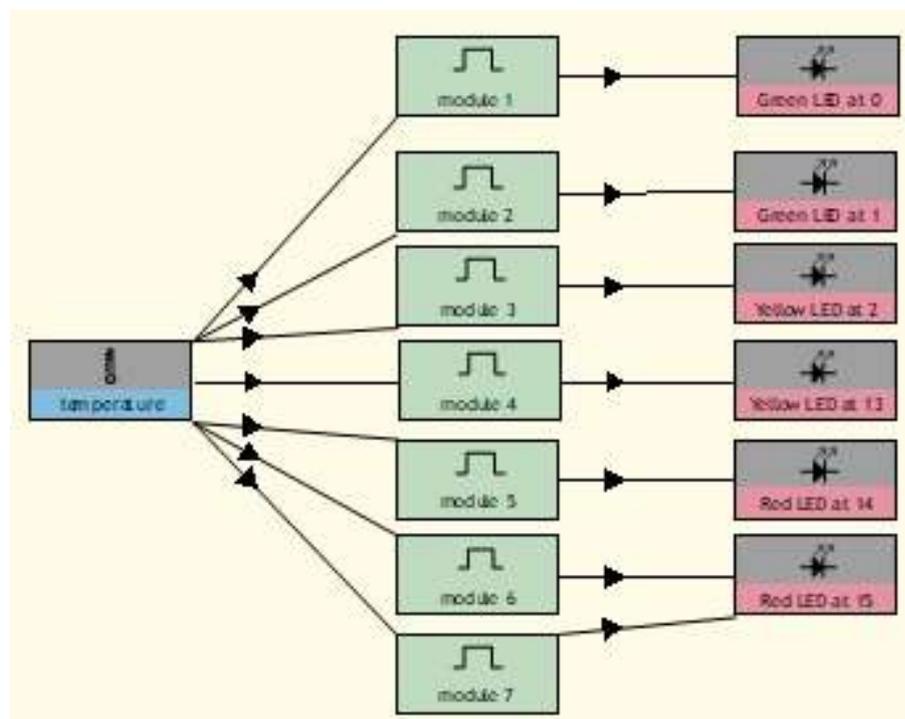
Discovery Kit Experiment 3 – Lights in Sequence

The program in the Mr Bit control module contains a sequence of three instructions which continue in a 'loop' until you switch off the battery. Each instruction lights up a different colour LED for a short time.



Discovery Kit Experiment 4 – Digital LED Thermometer

The coloured LEDs give an indication of the temperature sensor in the micro:bit: green is low and red is high. The program shows how the Mr Bit control module for each LED detects a different temperature.



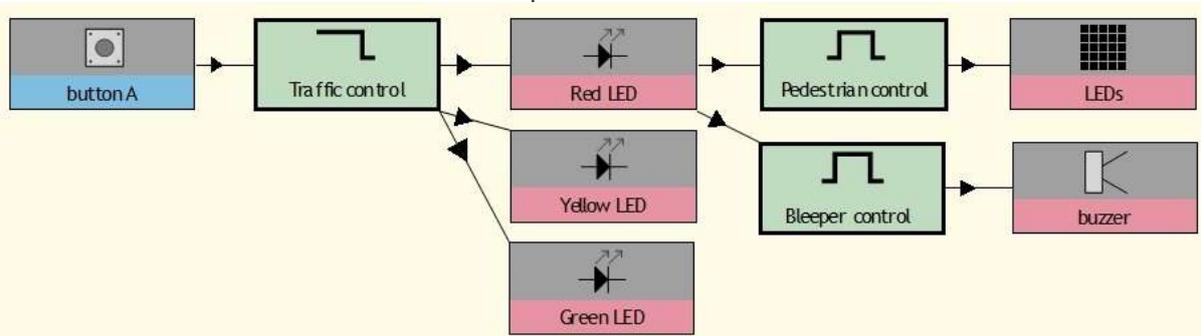
```

Program Script
module 1
  While it is warmer than 18, switch on the Green LED at 0.
module 2
  While it is warmer than 20, switch on the Green LED at 1.
module 3
  While it is warmer than 22, switch on the Yellow LED at 2.
module 4
  While it is warmer than 24, switch on the Yellow LED at 13.
module 5
  While it is warmer than 26, switch on the Red LED at 14.
module 6
  While it is warmer than 28 and cooler than 30, switch on the Red LED at 15.
module 7
  When it is warmer than 30, switch on the Red LED at 15 for 0.5 seconds.

```

Discovery Kit Experiment 5 – Traffic Light with Pedestrian Crossing

The Traffic control program lights the red, yellow and green LEDs in the UK traffic light sequence when button A gets pressed. When the Red LED is on, the stick image becomes animated and the buzzer bleeps.



```

Program Script
Traffic control
  Switch on the Green LED until button A gets pressed.
  Switch on the Yellow LED for 2 seconds.
  Switch on the Red LED for 6 seconds.
  Switch on the Red LED and the Yellow LED for 2 seconds.
Pedestrian control
  While the Red LED is off, show the LED image (wait).
  While the Red LED is on, show the LED animation (cross).
Beeper control
  While the Red LED is on, play "bleeps" on the buzzer.

```