UNIVERSITI TEKNOLOGI MARA

CAWANGAN SARAWAK

ROBOTRONIX Module micro:bit

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Introduction
Mini Robot

Must-have items

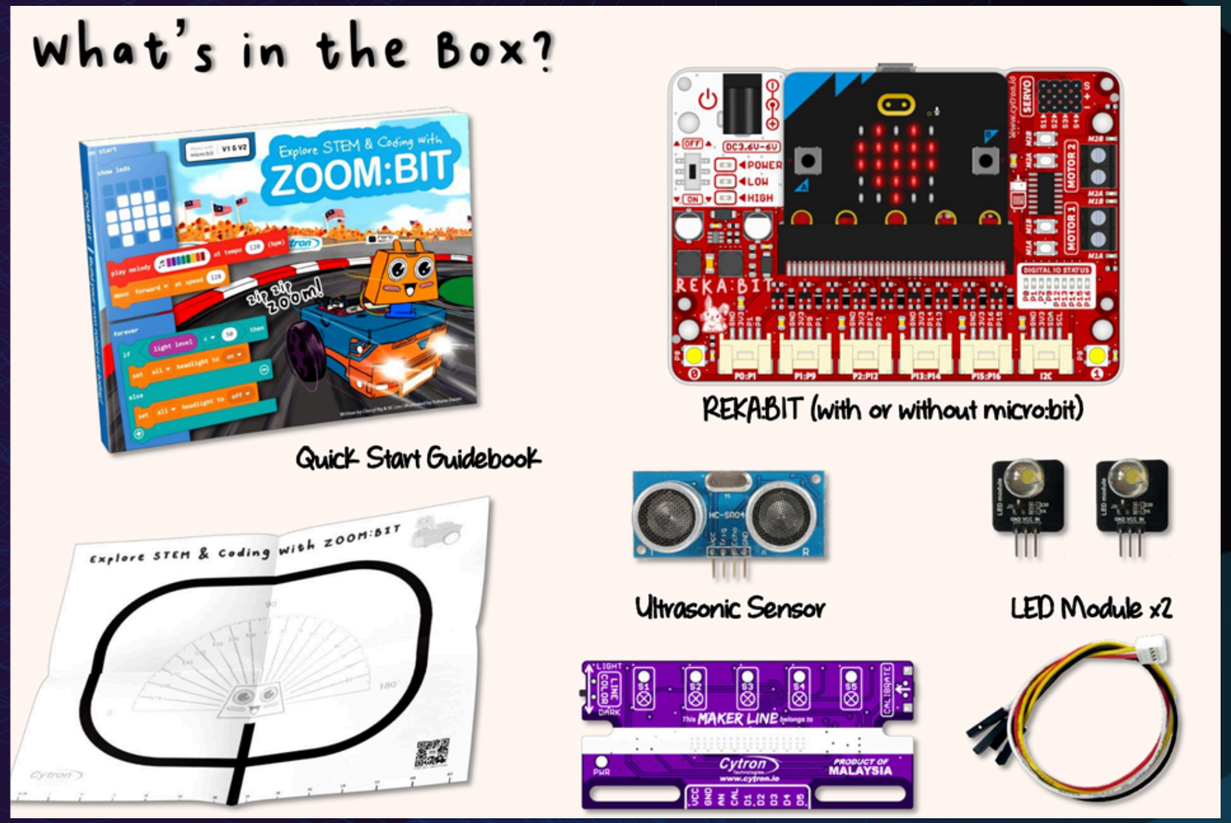
Laptop (Windows / macOS)

ZOOM:BIT Robot

4 x AA batteries (Eneloop Pro)

Parts

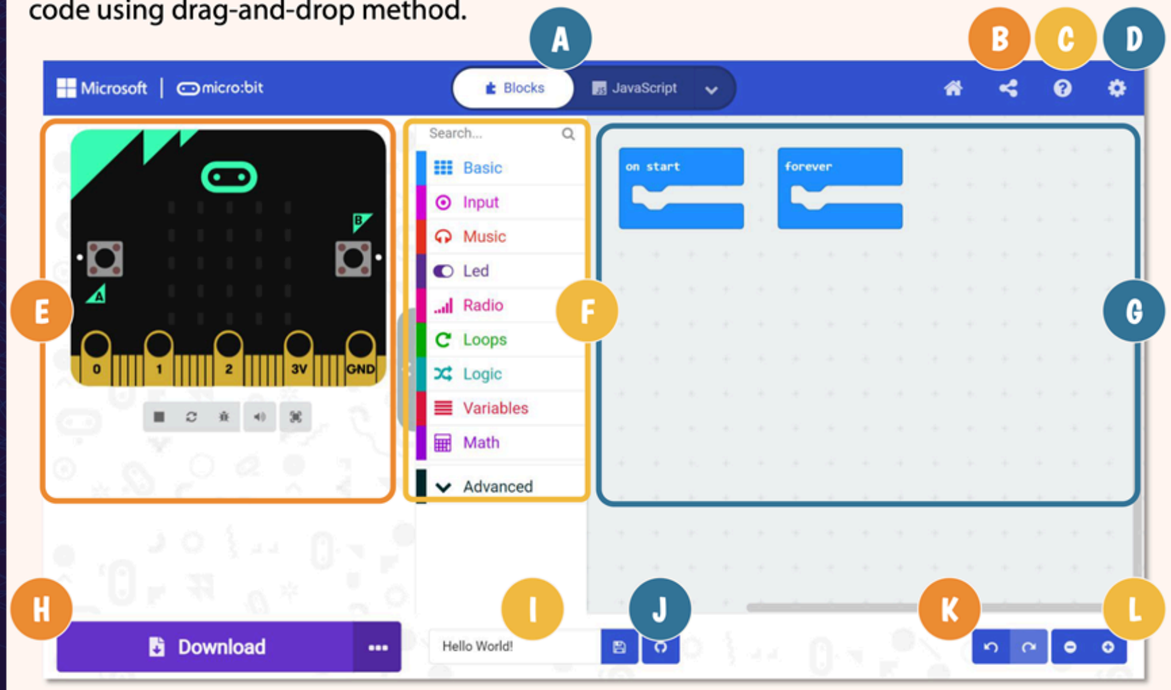

Castor
DC Motor & Wheel x2
Screwdriver
Screw & Nut x4
Power & Data Cable
Double-sided Tape x5
AA
1.5V


What's in the Box?
Explore STEM & Coding with ZOOM:BIT
Quick Start Guidebook
REKA:BIT (with or without micro:bit)
Ultrasonic Sensor
LED Module x2
Explore STEM & Coding with ZOOM:BIT
MAKER LINE
Cytron
PRODUCT OF MALAYSIA

Overview of makecode Interface

- **A** Choose to program in Blocks, JavaScript or Python.
- **B** Publish and share your project.
- **C** Open Help menu.
- **D** Change settings, add extensions, connect device, etc.
- **E** **Simulator** - Show you a simulation of your code.
- **F** **Toolbox / Category Drawers** - Get the coding blocks that you need here. Click to see available coding blocks for each category.
- **G** **Programming Workspace** - Build your code here by snapping blocks together.
- **H** Click to download your code to ZOOM:BIT.
- **I** Name and save current project to your computer.
- **J** Create GitHub repository.
- **K** Undo / Redo
- **L** Zoom in / out.

You will see this **Microsoft MakeCode Editor** page which allows you to easily build your code using drag-and-drop method.



Overview of Input/Output

INPUT / DERIA RASA MASUKAN

- *Ultrasonic Sensor*
- *Light Sensor*
- *Microphone*
- *Line Sensor*
- *Accelerometer*
- *Temperature Sensor*
- *Compass*
- *Touch Logo*

OUTPUT / KELUARAN

- *Servo*
- *LED Matrix*
- *Buzzer*
- *DC Motor*
- *Headlights*
- *RGB onboard*

INPUT

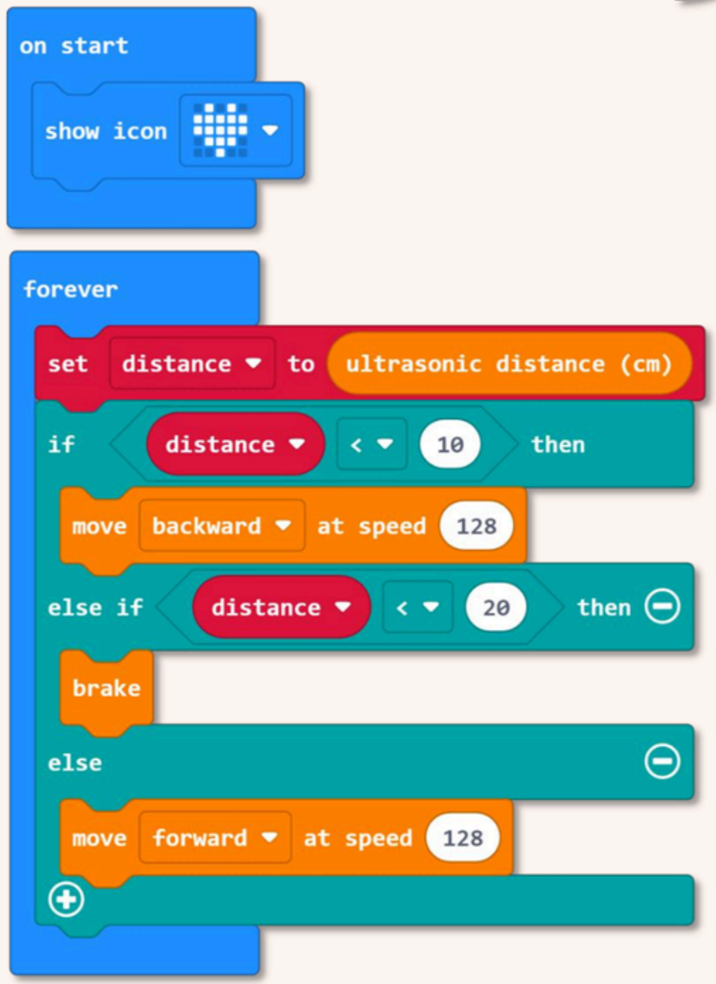
Ultrasonic Sensor

1. Create a new project in your MakeCode Editor and add ZOOM:BIT extension (you can refer to pp. 44-45).

2. Build this code. You can get the blocks you need from these category drawers:

Basic | ZOOM:BIT | Logic | Variables

You'll need to create a new variable ("distance") and set it to always get the ultrasonic sensor value.
You can go to https://link.cytron.io/zoombit-tutorial-7 for step-by-step guide to build the code if you need more guidance.



Light Sensor

4 Build the following code.

```
on start
    show icon
forever
    if light level < 50 then
        set all headlight to on
    else
        set all headlight to off
```

On start, show heart icon.

Always check surrounding light level.

If light level is below 50 (i.e. the surrounding is dark), turn ON headlights.

Else, turn OFF headlights.

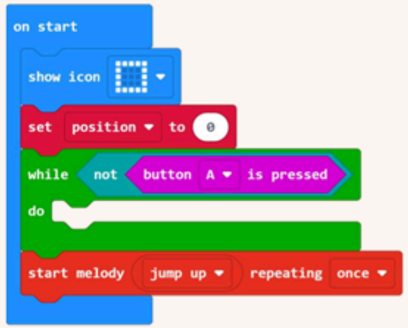
You can find the blocks you need from the following category drawers:

- Basic
- Logic
- Input
- ZOOM:BIT

For more guidance, you can go to https://link.cytron.io/zoombit-tutorial-3 for step-by-step guide to build the code.

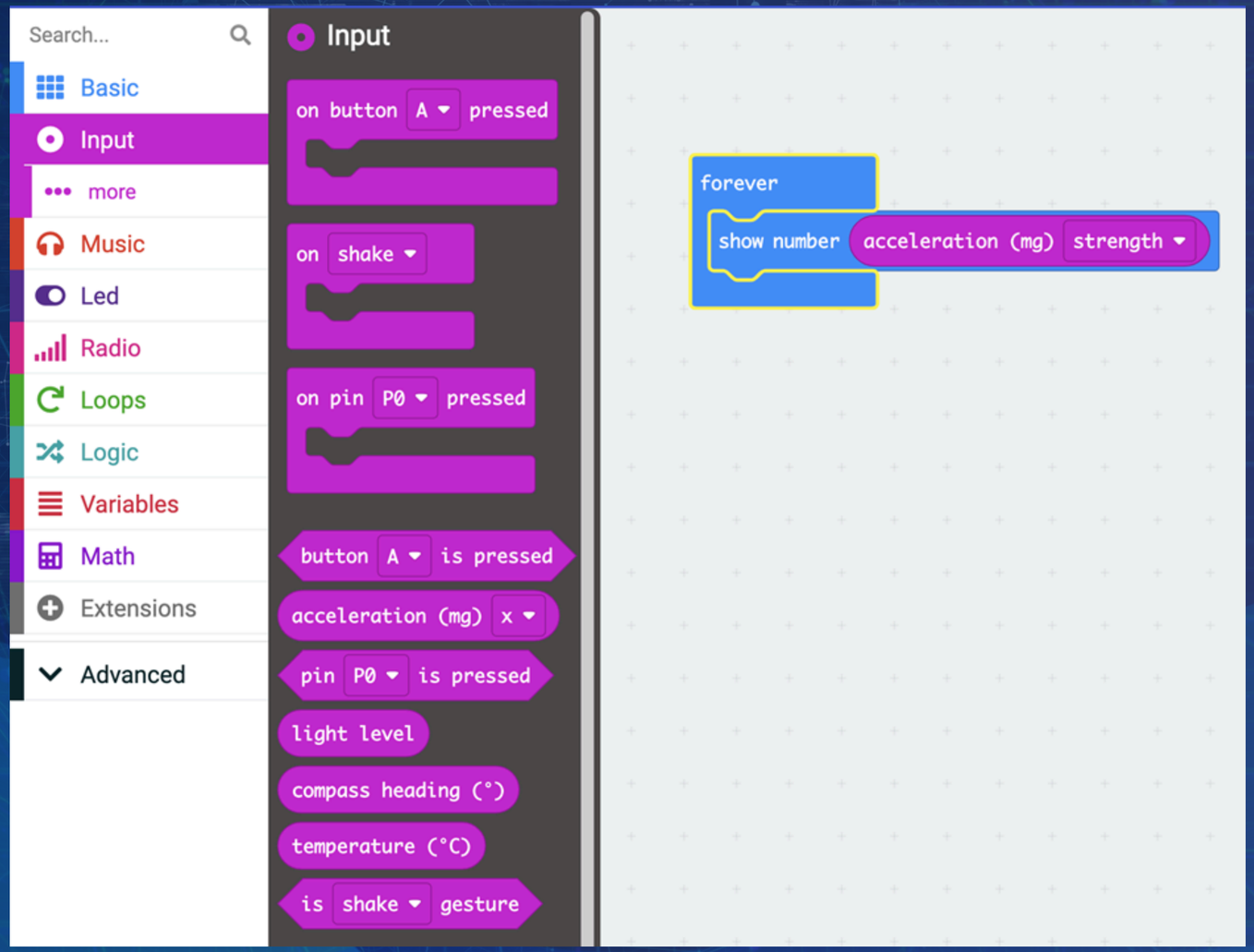
Line Sensor

7 Download the completed code to your ZOOM:BIT. Power it up, place it on the track and press Button A.

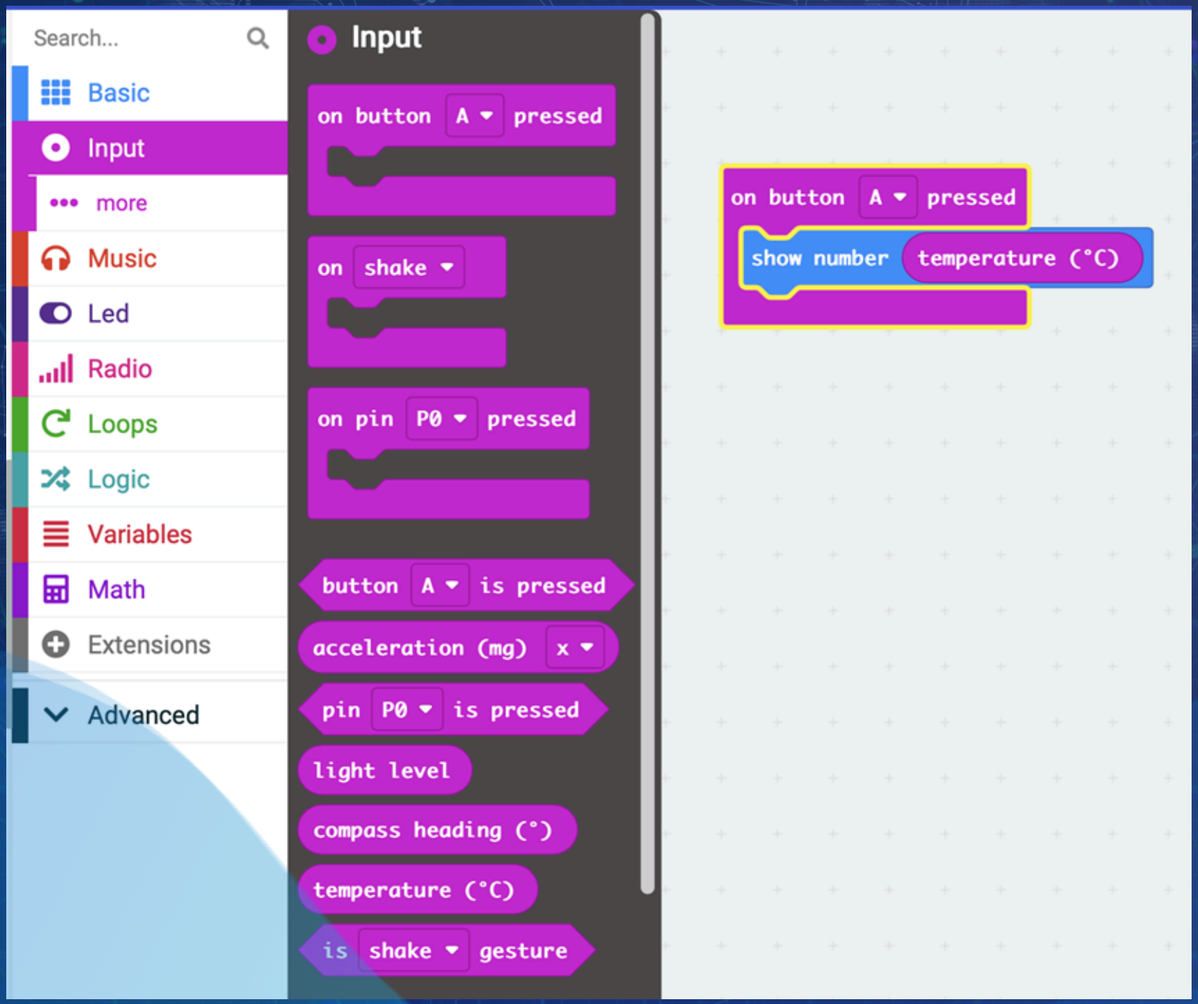


Let's test. Try to push ZOOM:BIT off track (until no line is detected by Maker Line). Do you notice ZOOM:BIT readjusting its position to get back on track, instead of wandering off?

Accelerometer

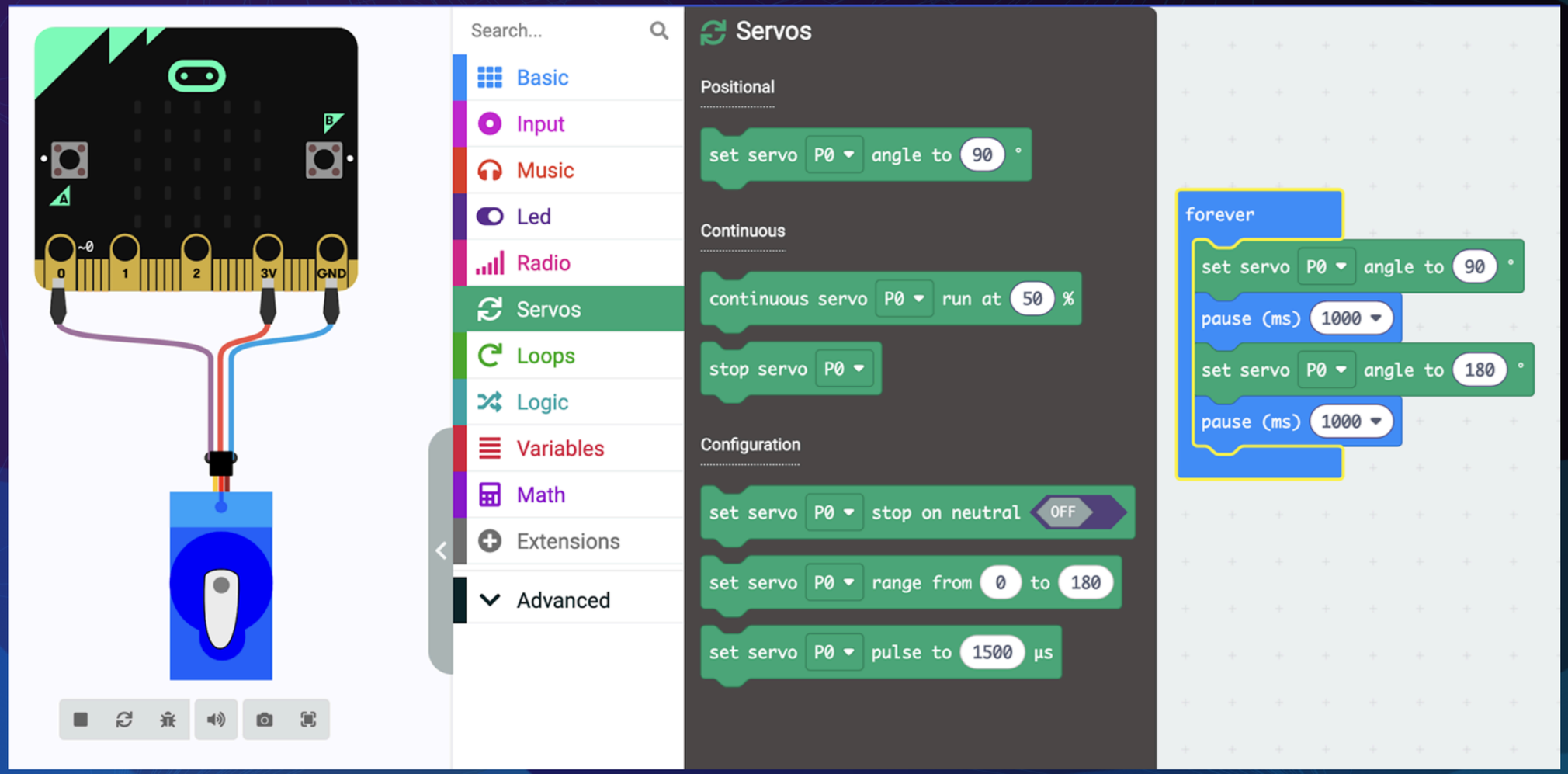


Temperature Sensor



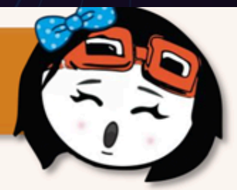
OUTPUT

Servo


Search...
Basic
Input
Music
Led
Radio
Servos
Loops
Logic
Variables
Math
Extensions
Advanced
Servos
Positional
set servo P0 angle to 90 °
Continuous
continuous servo P0 run at 50 %
stop servo P0
Configuration
set servo P0 stop on neutral OFF
set servo P0 range from 0 to 180
set servo P0 pulse to 1500 µs
forever
set servo P0 angle to 90 °
pause (ms) 1000
set servo P0 angle to 180 °
pause (ms) 1000
0
1
2
3V
GND

DC Motor

Now we're ready to program ZOOM:BIT to move around... Let's start! Zip zip Zoom ~



1. Create a new project in your MakeCode Editor and add ZOOM:BIT extension (you can refer to pp. 44-45).
2. Build the code below. You can get the blocks you need from these category drawers:

Basic | Input | ZOOM:BIT

```
on start
  show leds
```



```
on button A pressed
  turn right at speed 128
  pause (ms) 500
  brake
```

```
on button B pressed
  turn left at speed 128
  pause (ms) 500
  brake
```

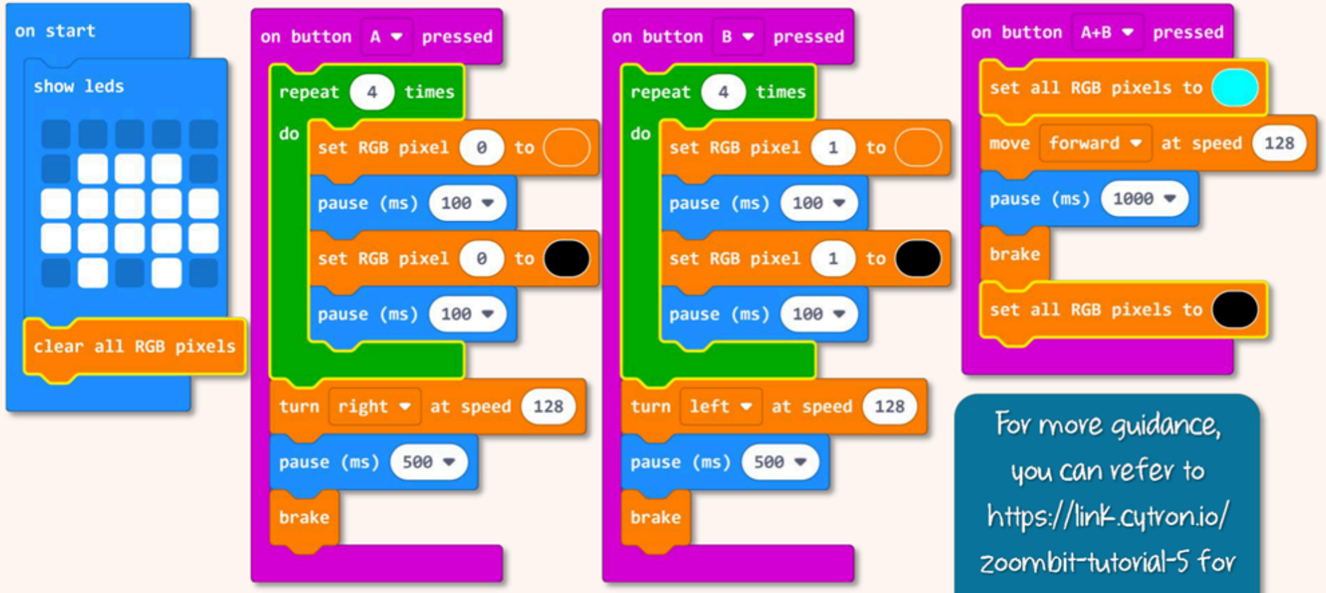
```
on button A+B pressed
  move forward at speed 128
  pause (ms) 1000
  brake
```

You can go to https://link.cytron.io/zoombit-tutorial-4 for step-by-step guide to build the code if you need more guidance.

RGB Onboard

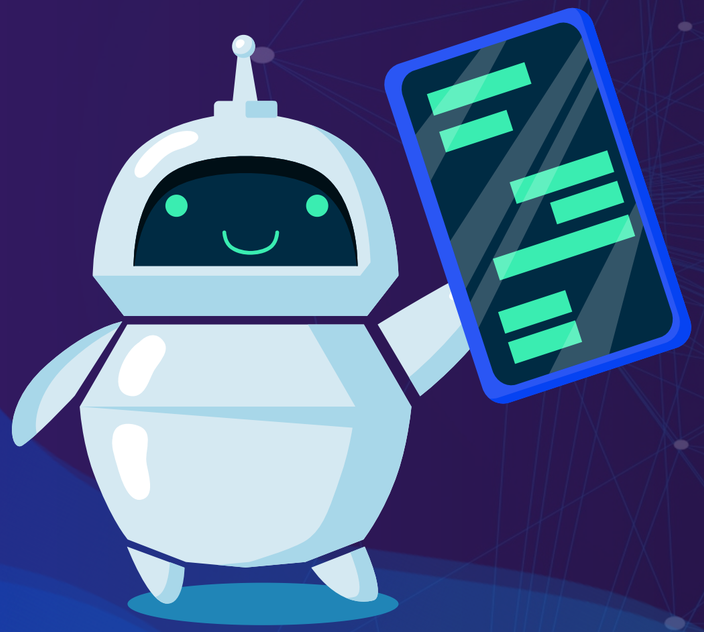
There are two RGB LEDs on REKA:BIT board, labelled " 0 " and " 1 ". You can program them to light up in different colours using blocks from [REKA:BIT] category drawer.

1 Add the following highlighted blocks from [Basic], [Loops] and [REKA:BIT] category drawers to your code from the previous lesson.



For more guidance, you can refer to https://link.cytron.io/zoombit-tutorial-5 for step-by-step guide to build the code.

Potential Project Ideas with Micro:bit



- *Agriculture*
- *Smart Home*
- *Home Security*
- *Health Monitoring*
- *Automation*
- *Robotics*
- *Traffic Survey Data Logger*
- *Traffic Survey Data Logger*
- *Energy Cost Calculator*
- *LED Matrix Sketch*
- *Solar Weather Station*
- *Physical Training Recognition*
- *Cat Feeder*
- *Digital Measuring Roller*
- *Robot Hand*

Innovation Project with Micro:bit

Things to consider when building a project with micro:bit ;-

- ***Based on recyclable materials***
- ***Low-cost prototyping***
- ***Practicality***
- ***Ease-of-use***
- ***User-friendly***

Thank You

Robotronix Module

micro:bit

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