Clumsy reptile

1. Learning objectives

In this course, we mainly learn how to use Python programming to make the creeper car move forward and backward.

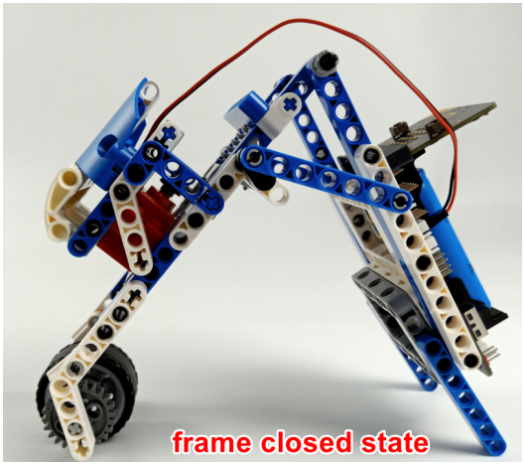
Walking principle of creeper car:

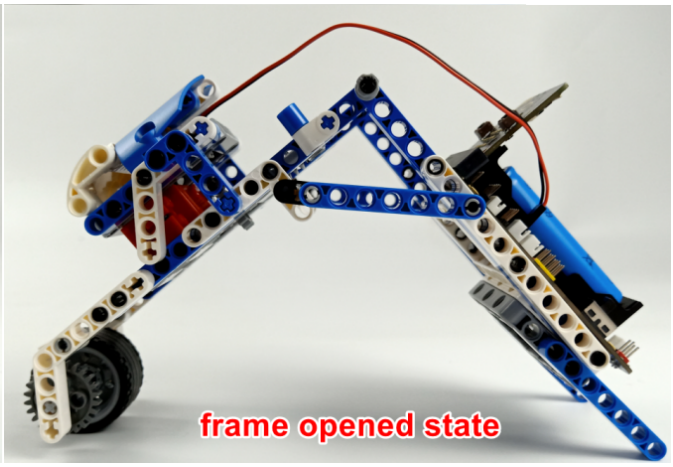
The friction of the front wheel is changed by adjusting the 1# bolt connection buckle ratchet to control the forward direction of the car. When the 1# bolt connection is located in front of the 24-tooth gear, the front wheel can only move forward, so the car creeps forward; when the 1# bolt is connected to the back of the 24-tooth gear, the front wheel can only move backward, and the car creeps backward.

2. Building blocks

For the steps of building blocks, please refer to the installation drawings of [Assembly course]-[Unicycle] in the materials or the building block installation album.

After assembly, the frame of the creeper car needs to be adjusted to the closed state.

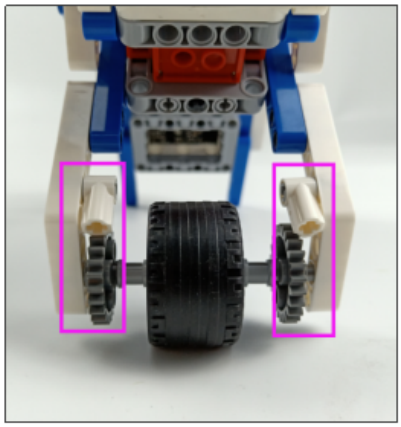




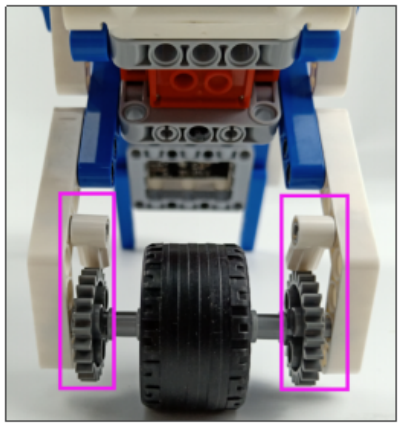
! Special Notes:

Place the two ratchets in front of the 24-tooth gear so that the crawler can move forward.

Place the two ratchets behind the 24-tooth gear so that the crawler can move backward.



【1# bolt connector are placed in front of the 24-tooth gear】



【1# bolt connector are placed behind the 24-tooth gear】

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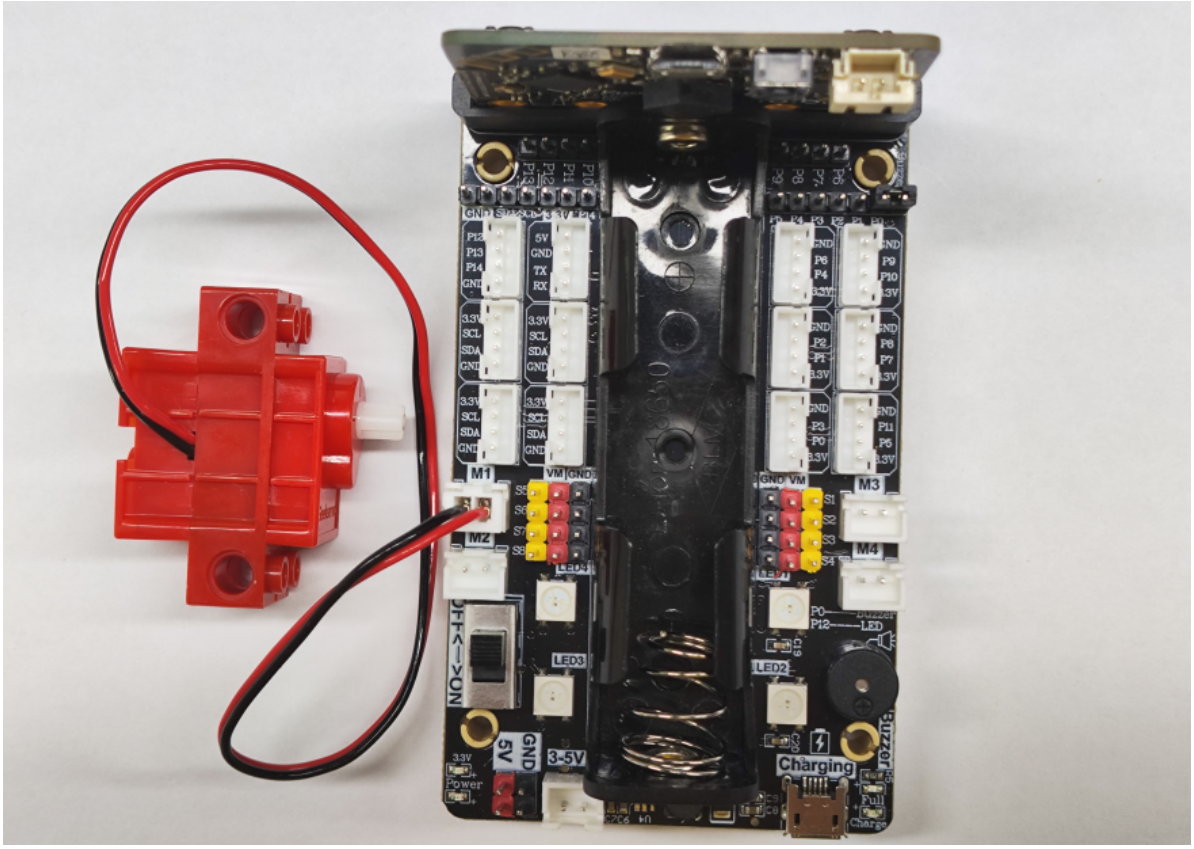
3. Motor Wiring

Insert the motor wiring on the left side of the car into the M1 interface of the Super:bit expansion board, with the black wire close to the battery side;

As shown below:



4. Code Analysis

For the program of this course, please see the **Clumsy reptile.py** file.

```
from microbit import *
import superbit
import microbit
```

First, import the library needed for this lesson from microbit: the superbit library is dedicated to the superbit expansion board.

```
display.show(Image.HAPPY)
```

display.show(Image.HAPPY): Display a smiley face pattern on the microbit dot matrix;

```
while True:
superbit.motor_control(superbit.M1, -255, 0)
microbit.sleep(2000)
superbit.motor_control(superbit.M1, 255, 0)
microbit.sleep(2000)
```

while True: infinite loop

superbit.motor_control(superbit.M1, -255, 0): The motor of the M1 interface reverses at a speed of 255, and the crawler frame opens;

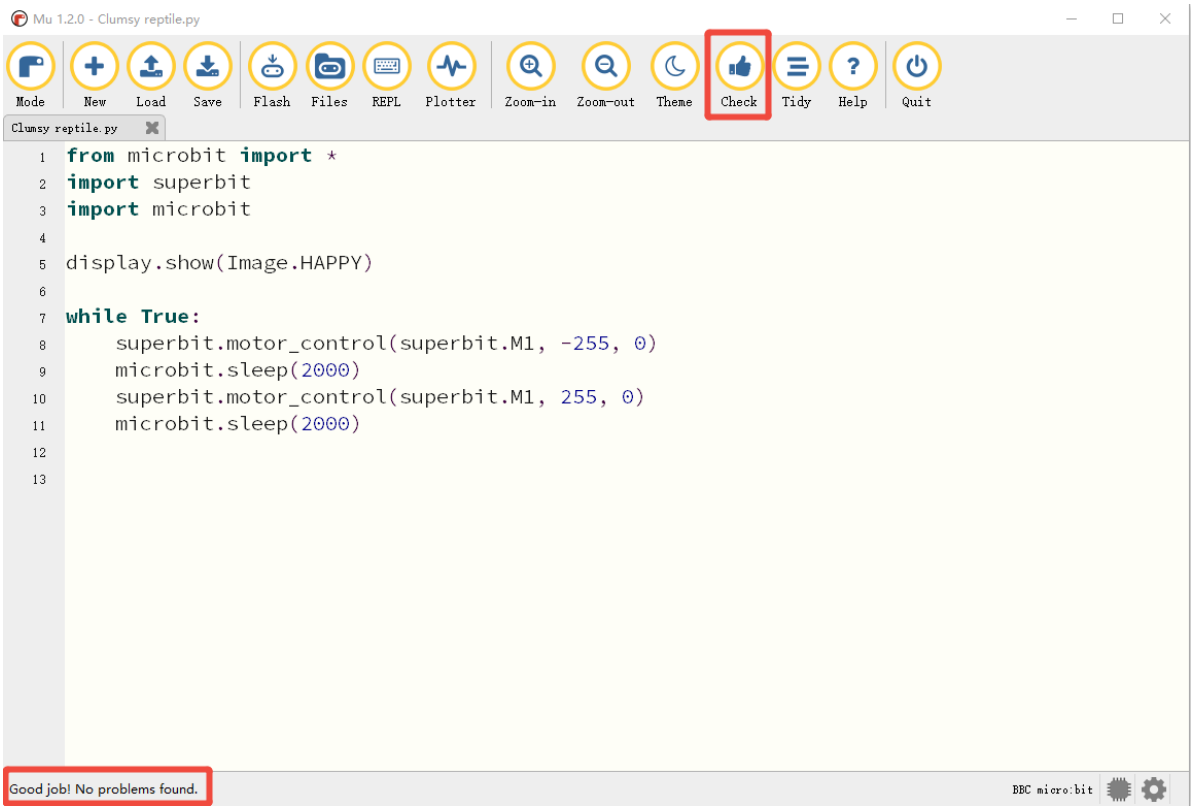
microbit.sleep(2000): Delay

superbit.motor_control(superbit.M1, 255, 0): The motor of the M1 interface rotates forward at a speed of 255, and the creeper frame is closed;

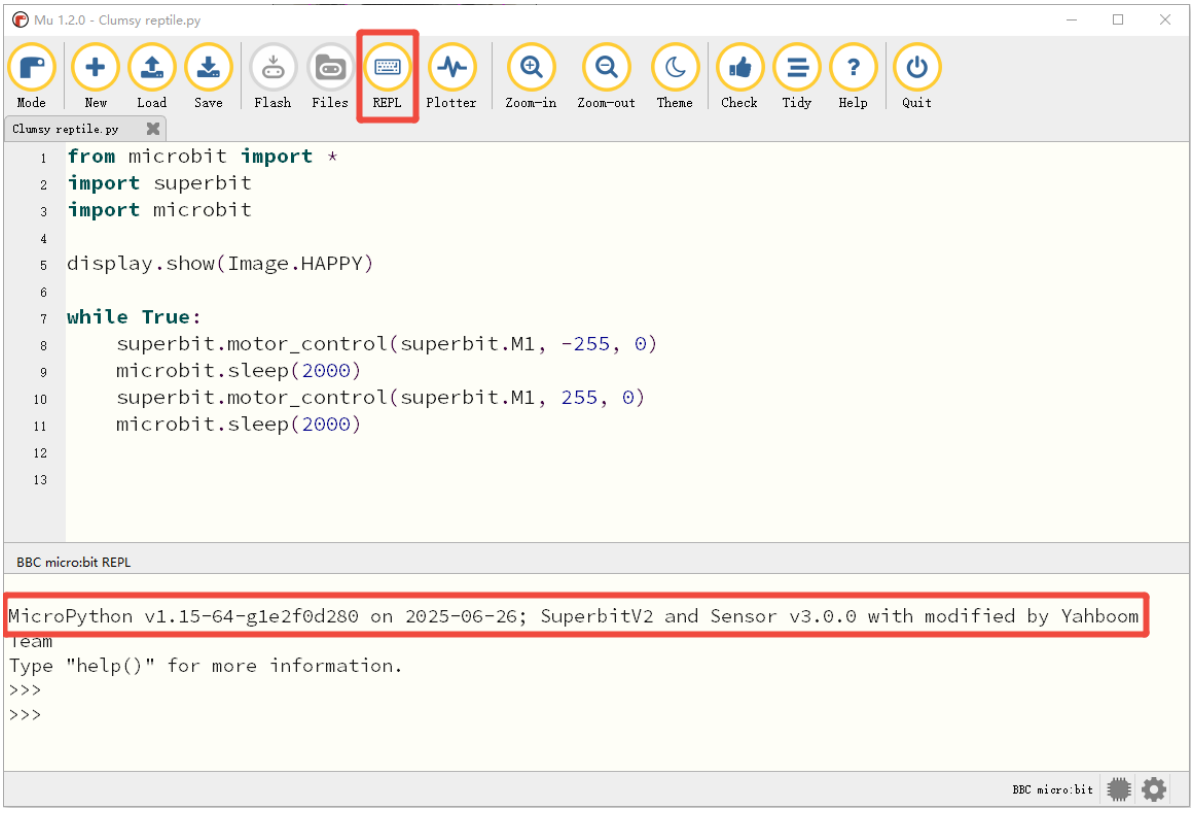
microbit.sleep(2000): Delay

5. Write and download the program

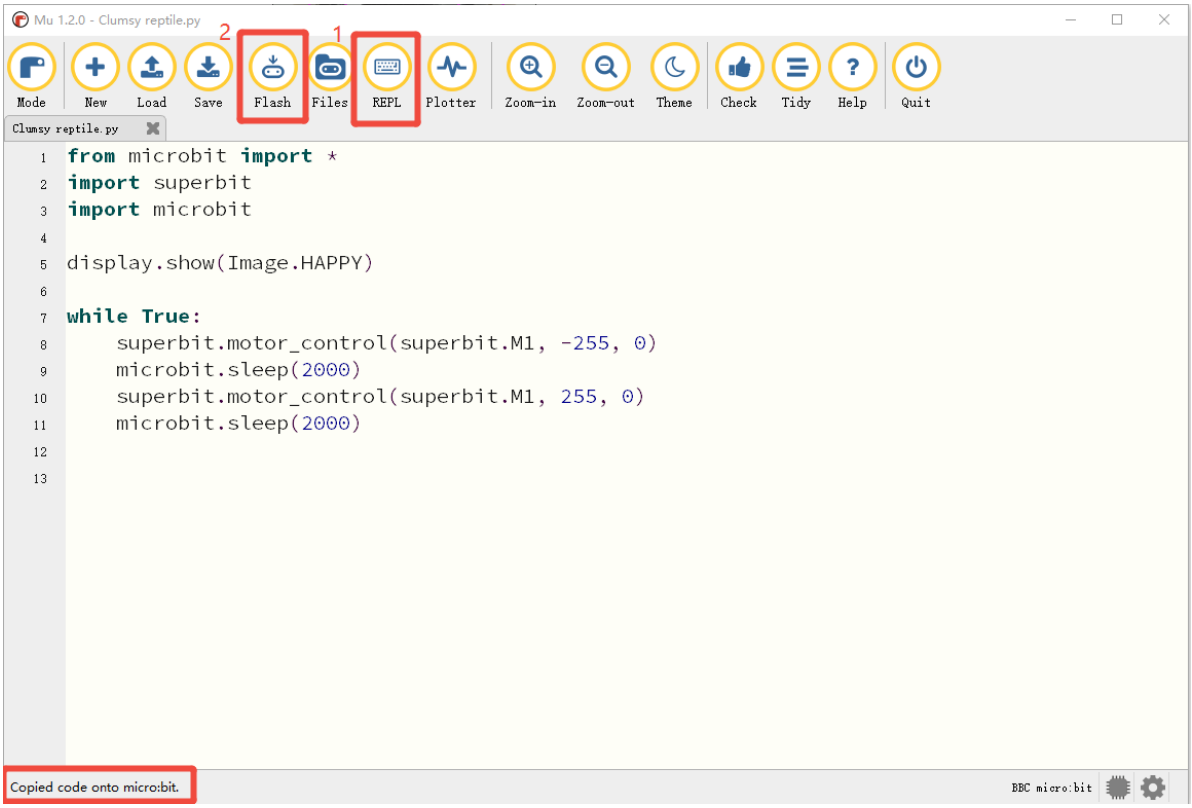
1. Open the Mu software and enter the code in the editing window. **Note! All English and symbols should be entered in English mode, use the Tab key (tab key) for indentation, and the last line ends with a blank program.**
2. Click the thumb 'Check' button to check whether our code has errors. If a cursor or underline appears in a line, it means a syntax error. Please check and modify it. If there is no error, the lower left corner will prompt that there is no problem with the detection.



3. Click the 'REPL' button to check whether the Superbit library has been downloaded. If not, please refer to [Preparation before class] --> [2.4 Python Programming Guide].



4. After the program is written, connect the computer and microbit mainboard with a microUSB data cable, click the 'Flash' button to download the program to the micro:bit mainboard. **(You need to click the 'REPL' button again to turn off the import library file function before you can download the program normally).**



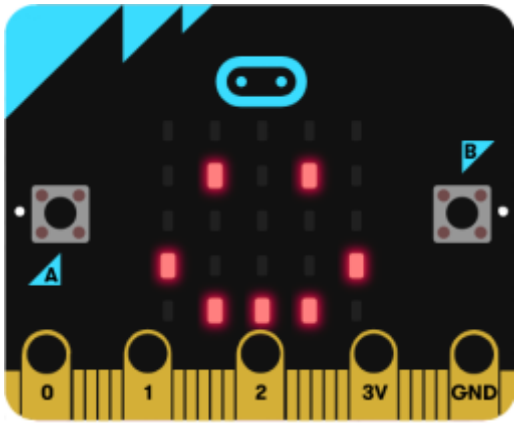
5. If the download fails, please confirm whether the microbit is connected to the computer normally via the microUSB data cable and the Superbit Python library has been imported.

6. Experimental phenomenon

After the program is downloaded successfully, turn on the power switch, and a smiley face pattern will be displayed on the micro:bit dot matrix, as shown in the figure below.

Case 1: If we put two 1# bolt connections in front of the 24-tooth gear, the motor reverses for two seconds (the frame opens) --> forward for two seconds (the frame closes), and the crawler will move forward.

Case 2: If we put two 1# bolt connections behind the 24-tooth gear, the motor reverses for two seconds (the frame opens) --> forward for two seconds (the frame closes), and the crawler will move backward.



Please press the reset button on the back of the micro:bit motherboard if you need to restart.