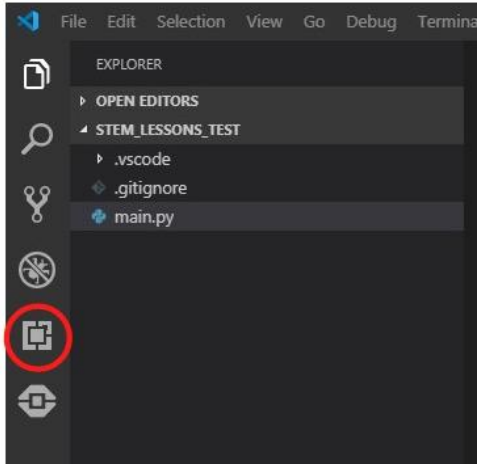
EV3 Micropython Lesson 1

By STEMPowering Girls
stempoweringgirls.org

Downloading MicroPython

1. Download Visual Studio Code
2. Follow the directions it gives you to install VS Code
3. Start the application
4. Open the extensions tab
5. In the extensions tab search for EV3 MicroPython
6. Download the first extension that shows up
    a. should have the Ev3 Logo



Variables

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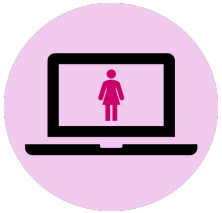
Variables

Variables are used to store things.

In python, they can be used to store anything from numbers

to pieces of code



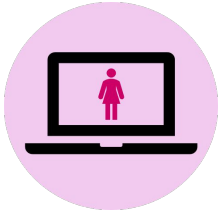
Variables

In MicroPython, most people use variables to store the ports of motors and sensors.

If you wanted to initialize a motor at port B:

```
MotorB = Motor(Port.B)
```

Now, anytime you need to use that motor you can call on it using the variable you just made.



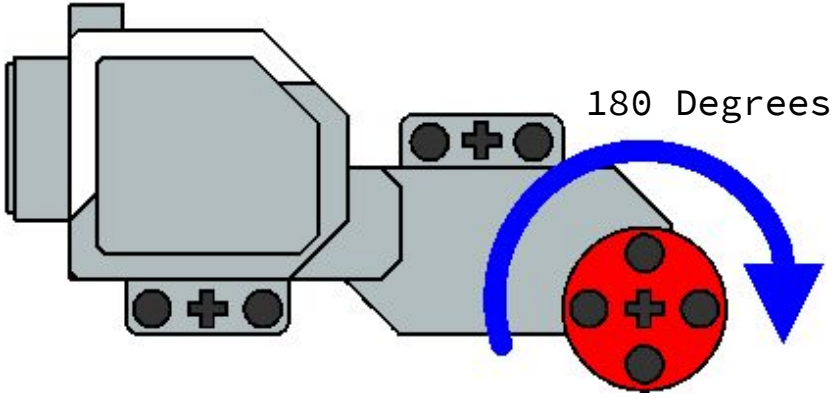
run_target()

run_Target

The run_target function is used to make to robot go forward for at a certain speed for a certain number of degrees.

1 Rotation = 360 degrees

```
motorB.run_target(500, 90)
```

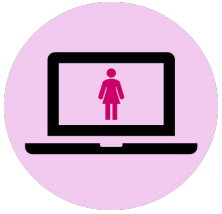


Run_Target

This part of run_target tells the robot to run motor B at a speed of 500 degrees per second.

The speed range of micro python is 0 - 1000 degrees per second.

```
motorB.run_target(500, 90)
```



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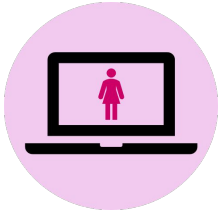
Run_Target

This part of run_target specifies the amount of degrees. In this case, it tells to robot to go for a distance of 90 degrees or ¼ of a rotation.

```
motorB.run_target(500, 90)
```



Now Try it Yourself!

Intalize Motors in Port B and C and Make them Travel 1 Rotation at speed of 300

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Direction

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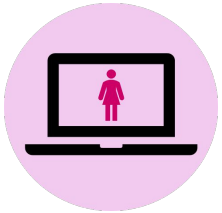
Direction

The direction of the wheel rotation is by default Clockwise. To change the direction, you need to specify it when you initialize the motor. You can also make the speed negative.

```
motorB = Motor(Port.B, Direction.COUNTERCLOCKWISE)
```



NOW Try it Yourself!

Make the Robot Go backwards for 2 Rotations

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Run

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RUN

The run Function is almost exactly like run_target. It uses the speed parameter but will go on forever.

To stop, use the function .stop().

If you want to wait between starting and stop (you normally do), use the wait function.

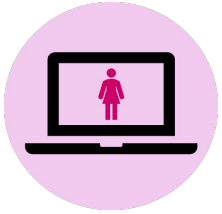
```
motorB.run(500)

wait(2000)

motorB.stop()
```

`Stop.COAST` lets the robot slow to a stop

`Stop.BRAKE` makes the robot stop immediately

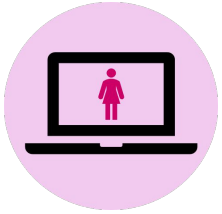


Run_time()

RUN_TIME

The run_time Function is exactly like run_target but instead of using degrees in uses time as the stop parameter.

```
motorB.run_time(500,1000)
```



Wait

Wait Function

The waits function tells the program whether or not complete the block before running the next block after.

By default it's set to True.

```
motorB.run_target(500,90,wait = False)

motorB.run_target(500,90,wait = True)
```

TURNING

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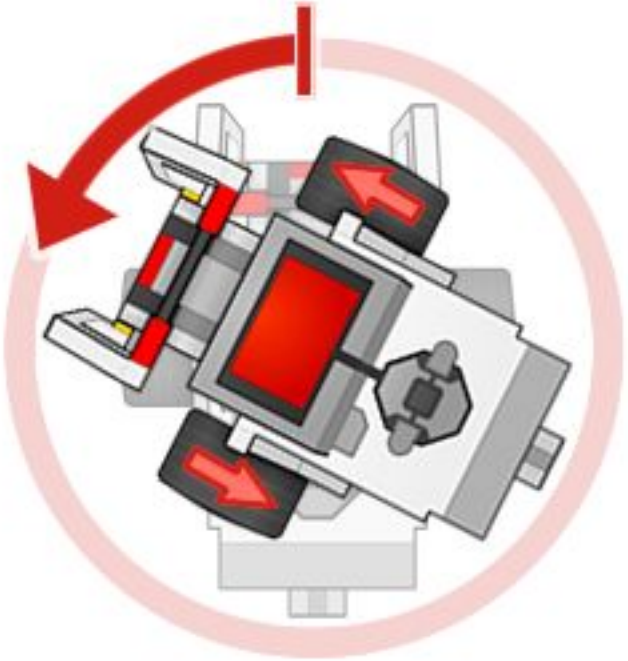
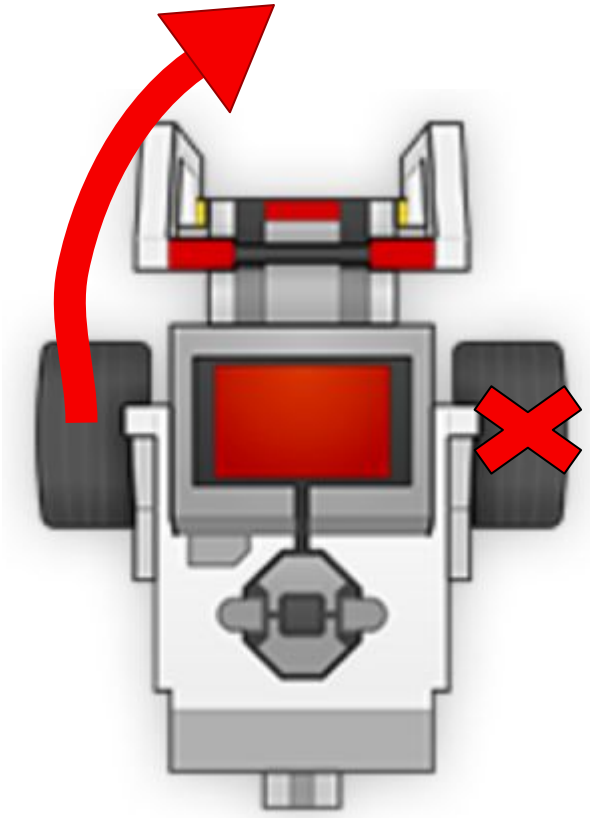
Pinpoint Turns

A pinpoint turn is when one motor goes forward while the other motor goes backwards. It causes the robot to spin in its center of gravity.



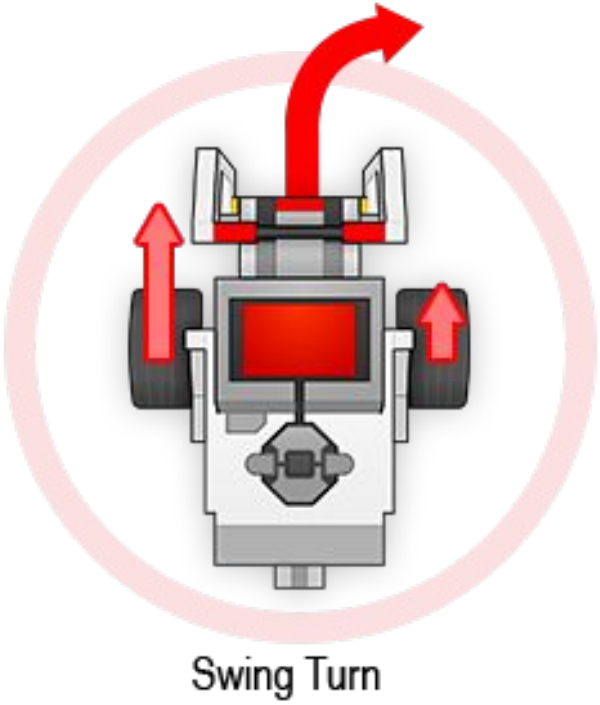
Pivot Turn

A pivot turn is when one motor it stop while the other goes forward. It causes the robot to pivot around the stopped wheel.



Swing Turn

A swing turn is when both motors are driving forward but one is moving faster than the other.



Swing Turn

NOW Try it Yourself!

Choose Your Favorite Turn and then have the robot turn 180 Degrees

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