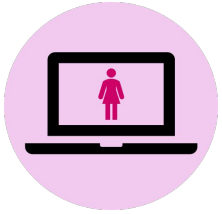
EV3 Micropython Lesson 2

By STEMPowering Girls
stempoweringgirls.org

Review

Last week, we learned how to make the robot move forward and backwards, degrees and rotations, and different types of turns.



If Statements

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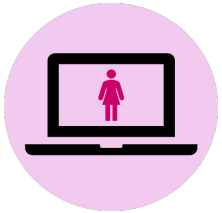
If Statements

If statements check if the condition(s) are true and proceed as such. If the condition is true, then the computer will run whatever is in that statement.



While Loops

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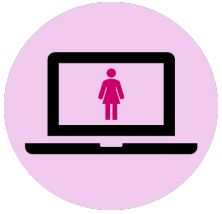
While Loops

While loops run the code inside them over and over again until the condition(s) are turned false.



Brick Buttons

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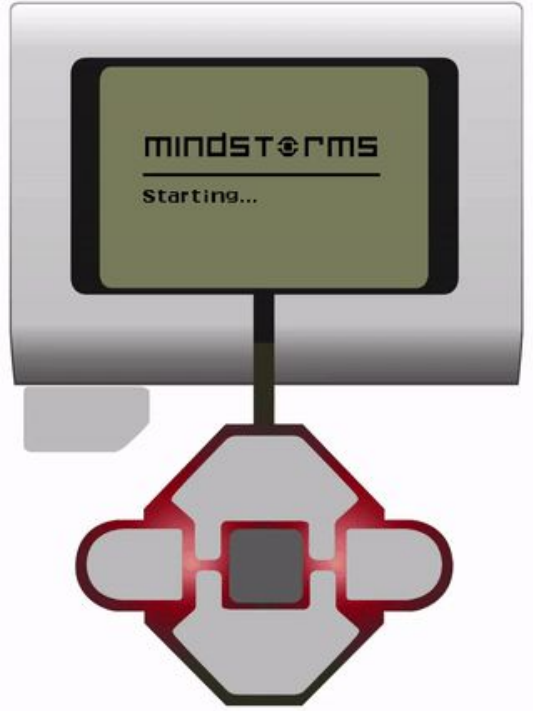
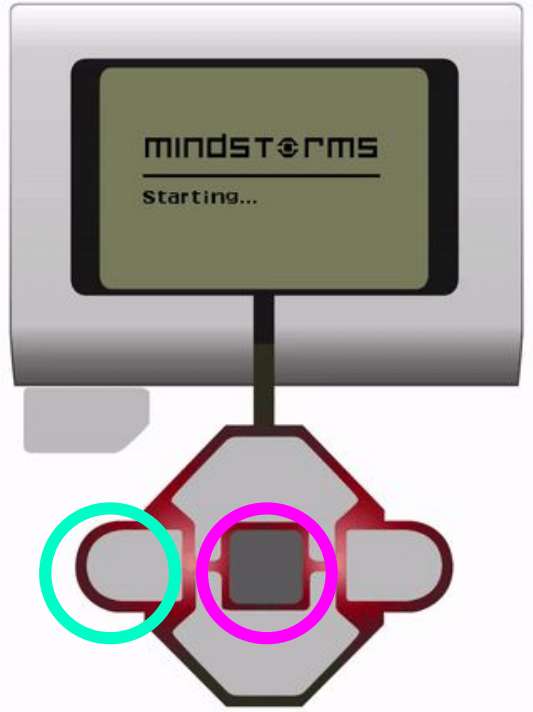
Brick Buttons

The buttons on the ev3 brick can be used to maneuver around the menus while a program isn't running but they can also be used in the program itself. The robot can detect when a button is pressed and respond accordingly.



Brick Buttons

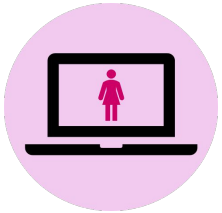
Each of the 5 buttons in the center of the brick are named according to their position. The button on the far left is called `Button.LEFT`, the one in the center is called `Button.CENTER`, and so forth.



Brick Buttons

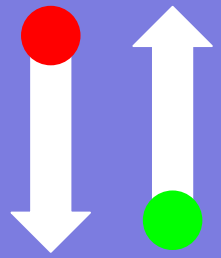
If you needed to check whether a certain button is pressed in an if/while loop:

```
if Button.LEFT() in brick.buttons():
```



Now Try it Yourself!

Use the Up to travel forward 1 rotation and the down button to travel Backward 1 Rotation



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Motor Sensors

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Motor sensors

Ev3 Motors have inbuilt sensors to provide us with (fairly) accurate data on how to the motor is doing while driving. They can detect anything from speed to whether or not the motor is stalled.

Motor Angles

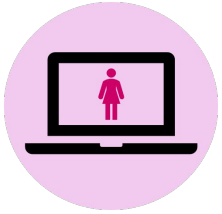
The angle of the motor is how many degrees it has travelled. Instead of resetting after each rotation it continues of grow (720 for 2 rotations, etc.). Its very useful in line following and gyro sensor programs.

To print out the current motor angle:

```
print(MotorB.angle())
```

To reset the angle:

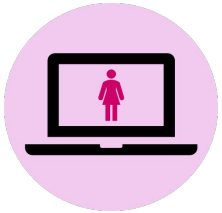
```
MotorB.reset_angle()
```



Motor Speed

The motor speed function returns the current speed of the motor that it has been called for.

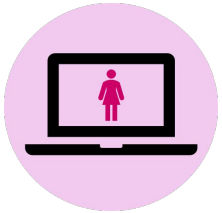
```
print(MotorB.speed())
```



Motor Stall

The motor stall function checks whether a motor is stalled. When a motor is stalled, it cannot move at all. If the motor is stalled, it will return TRUE. If not, it will return FALSE. This function is not used very often.

```
print(motorB.stalled())
```



NOW Try it Yourself!

Make the Motor Travel at a speed of 300 for 1.5 Rotations, while printing the speed/Angle of both motors. (Hint: You'll Probably need a while loop)

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Touch Sensor

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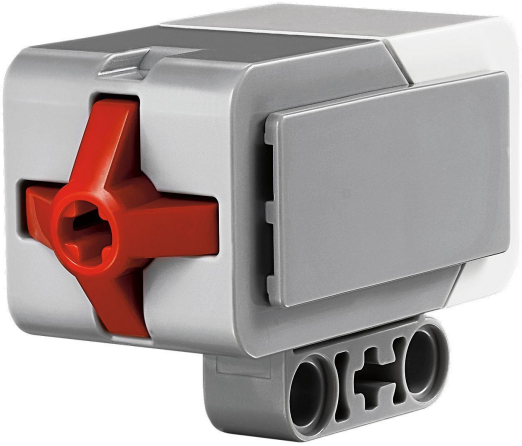
Touch Sensor

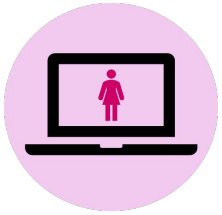
The touch sensor is a sensor that can detect whether or not it has been pressed. It is useful for checking whether or not the robot has run into a wall or another object.



Touch Sensor

The pressed() function checks whether or not the touch sensor is being pushed down. If it is, it returns TRUE. If not, it returns FALSE.

```
print(touch.pressed())
```



NOW TRY IT YOURSELF!

CREATE A PROGRAM THAT MAKES THE ROBOT GO FORWARD UNTIL IT RUNS INTO AN OBSTACLE (HINT: USE THE TOUCH SENSOR, NOT MOTOR STALL AND DON'T GO TO FAST)

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