EdPy worksheets

Student worksheets and activity sheets

Name_____

Lesson 4: Worksheet 4.2 – Use a loop to drive in a square

Repeating the same commands over and over is no problem for a computer, but writing out a program this way isn't very efficient. Instead, it is better to use a loop structure.

Watch Mark Zuckerberg, who created Facebook, explain the concept of loops when programming:
https://www.youtube.com/watch?v=hYvcoRkAkOU

Who knew being a great coder could make you one of the world's youngest billionaires?
Mark Zuckerberg's net worth is estimated to be more than 70.5 billion US dollars!

We can write a program to make Edison drive in a square with less code by using a 'for' loop. This will make writing the program more efficient. Since we will need to use fewer lines of code, using the 'for' loop will also help reduce the likelihood of mistyping and having a syntax error in the program.

The 'for' loop and 'range()' function in Python

In Python, a 'for' loop is a control structure which can be used to repeat sets of commands or statements any number of times.

Using a 'for' loop allows you to repeat (also called 'iterate over') a block of statements as many times as you like.

The 'for' loop often goes together with the 'range()' function in Python.

The range() function returns a set of values within a certain range.

In EdPy, range() only has one input parameter. That input parameter determines the upper limit of the set and the lower limit is always 0.

The range() function returns values from 0 to (input parameter – 1).

Example:

range(4) → there are 4 values in the set: 0, 1, 2, 3.

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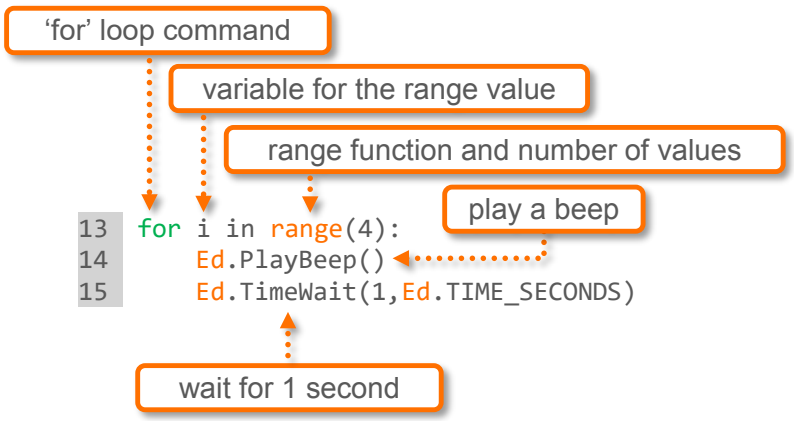
Let's look at an example:



In this example, the 'for' loop iterates four times, causing the variable 'i' to have the values 0, 1, 2 and 3. Each time it iterates, the loop executes the statement block consisting of Ed.PlayBeep() and Ed.TimeWait().

The result? The beep is played four times with a one-second delay in between each beep.

Your turn:

Write a program using the 'for' loop and the 'range()' function so that when your Edison robot drives, it makes a square. You should be able to complete the program using just two Ed.Drive() functions, one for forward and one for spin.

Don't forget to include a colon and proper indentation inside your loop.

1. What does your program look like? Write your code down below.

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Lesson 4: Worksheet 4.3 – Drive in a triangle and a hexagon

In this activity, you need to write two different programs to get your Edison robot to drive in the shape of a triangle, and then in a hexagon.

Your turn:

Task 1: Drive in a triangle

Write a program so that when your Edison robot drives, it makes a triangle.

1. How many times did your 'for' loop execute for your triangle shape?

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Task 2: Drive in a hexagon

Write a program so that when your Edison robot drives, it makes a hexagon.

2. How many times did your 'for' loop execute for your hexagon shape?

   _____

3. You should see a pattern emerging between the number of sides of the shape and the number of times the 'for' loop executes. Describe that pattern.

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4. How many times you would need the 'for' loop to execute to draw a regular (meaning that all sides are equal) 12-sided shape?

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