



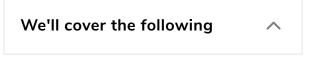






Example 1: Measuring Time Complexity

In this lesson, we are going to learn how to compute the running time complexity of an algorithm that involves loops.



- Simple For Loop of Size n
 - Running Time Complexity

In the previous lesson, we calculated the running time complexity of a very basic Python program. Lets now calculate the running time complexity of a more complex program. We will split the code into individual operations and then compute how many times each is executed.

Simple For Loop of Size n

Here is an example of a simple loop of size n:

```
1  n = 10 # just as an example, n can be anything
2  sum = 0
3  for var in range(n):
4     sum += 1
5
6  print(sum)
7
```

[3]	\$

Operation	Number of executions
n = 10	1
sum = 0	1
range(n)	1
var=0	1
var=1	1
var=2	1
var=n−1	1
sum+=1	3 imes n
print(sum)	2

Note that while range(n) executes only once, its execution cost is n. This is because it creates a list of values from 0 to n - 1.









Running Time Complexity#

After counting how many times each operation is executing, we will just add all of these counts to get the time complexity of this program.

$$1 + 1 + n + (1 + 1 + 1 + ... + 1) + 3n + 2$$

$$\Rightarrow 2 + n + n + 3n + 2$$

$$\Rightarrow 5n + 4$$

In the next lesson, we will look at another example of a program containing nested loops and compute its running time complexity.

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Next →

Comparing Algorithms

Example 2: Measuring Time Complexity



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