
CS 105: Introduction to Computer Science

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Spring 2025

More Things to Consider

Speed varies with nature of input, not just the size

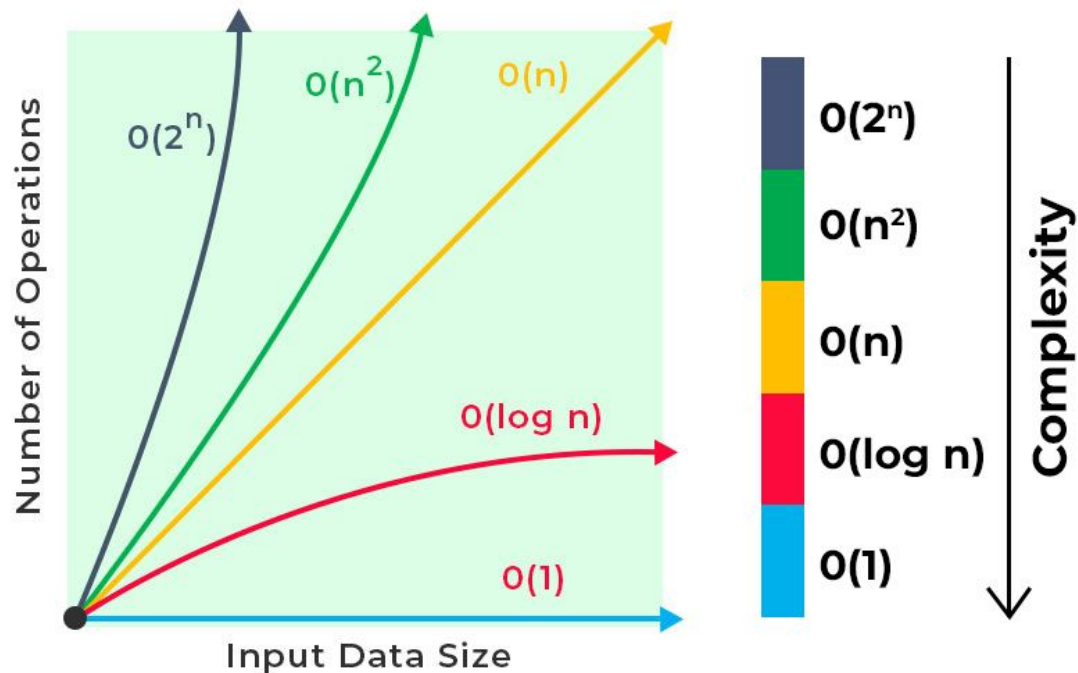
- try sorting a list that's already sorted, in Python
- by convention, pick the worst kind of input, for each given size
 - this helps find the maximum "cost" before you run an algorithm on an input

Big-oh Notation

Denotes the upper bound of an algorithm's runtime.

Focuses on order of complexity:

- Constant time: $O(1)$
- Linear time: $O(n)$
- etc.



Practice Measuring Complexity

What is the time complexity of the following functions?

```
def func(l1: List[int], l2: List[int]):  
    for i in l1:  
        print(i)  
    for i in l2:  
        print(i)
```

—————→ sequential steps: *add* their runtime

```
def f(l1: List[int], l2: List[int]) ->  
bool:  
    for i in l1:  
        for j in l2:  
            if i == j:  
                return True  
    return False
```

nested loops: *multiply* their runtime ←————