Time Complexity

→ What is time Complexity

. Time complexity is a way of talking about how fast or slow a computer program runs.
It help us understand if our program will still work well as we give it more and more data to process

. A good time complexity means our program stays fast even with a lot of data. while a bad one might make it slow down ~~too~~ much

→ Big O-Notation

Big O notation, is like using a simple label to describe the maximum time an algorithm might take in the worst-case scenario

→ We can express algorithic complexity using the big-O notation. For a problem of size N

. A constant-time function/method is "order 1" : O(1)
  ↳ When there is no dependence on the input size n (primitive operations)

. A linear-time function/method is "order N" : O(N)
  ↳ When the running time increases linearly with the length of the input (loops)

↳ To determine the time complexity of our code, we must examine it line by line, taking notes of the following factors:

- Assignments and math operators are all basic operation
- Loops and nested loops

!! Whenever we calculate the big O complexity of any algorithm, we can throw or ignore the constant:

$O(2n) \longrightarrow O(n)$

$O(1 + n/2 + 100)$ simplifies to just $O(n)$