Types of Time Function

Mohammed Rizin
Unemployed

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1 Introduction

So far we have seen a lot of functions and we calculated its time complexity. But we have not seen the types of time functions. In this article, we will see the types of time functions. Now let's see the types of time functions.

2 Types of Time Functions

The types of time functions are:

1. Constant Time Function $\rightarrow (O(1))$
2. Linear Time Function $\rightarrow (O(n))$
3. Quadratic Time Function $\rightarrow (O(n^2))$
4. Logarithmic Time Function $\rightarrow (O(\log n))$
5. Exponential Time Function $\rightarrow (O(2^n))$
6. Factorial Time Function $\rightarrow (O(n!))$
7. Polynomial Time Function $\rightarrow (O(n^k))$
8. n log n Time Function $\rightarrow (O(n \log n))$
9. Exponential Time Function $\rightarrow (O(n^n))$

3 Compare Time Functions

Let's compare the time functions. We will compare the time functions with the help of a graph. The graph is shown below.

$$1 < \log n < \sqrt{n} < n < n \cdot \log n < n^2 < n^3 < \cdots < 2^n < 3^n < n^n$$

$\log n$	n	n^2	2^n
0	1	1	2
1	2	4	4
2	4	16	16
3	8	64	256

Table 1: Time Functions

So,

$$n^{100} < 2^n$$
$$n^k < 2^n$$

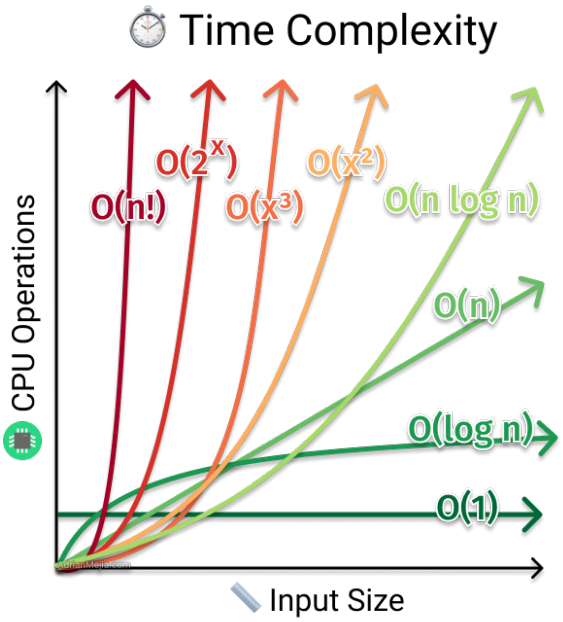

Figure 1: Time Functions