Topic to discuss

Types of Analysis

- Worst case
- Best case
- Average case

Types of Analysis :

To analyze the given algorithm, we need to know with which inputs the algorithm takes less time (performing well) and with which inputs the algorithm takes a long time.

To analyze algorithm we need some kind of syntax, and that forms the base for asymptotic analysis / notation.

There are three types of analysis:

- Worst case
- Best case
- Average case

Linear search : Search for the elements 45, 10, 38, 02

Array =

45	26	32	17	38	09	15	43	10
0	1	2	3	4	5	6	7	8

① 45 is present at 0 index.

Best case = $\Omega(1)$

② 10 is present at last index.

Worst case = $O(n)$

③ 38 is present at 4th index.

$$= \frac{\text{Total no. of possibilies}}{\text{no. of cases.}}$$

$$= \frac{1+2+3+\cdots+n}{n} = \frac{\frac{n(n+1)}{2}}{n} = \frac{n+1}{2}$$

Average case = $= \theta\left(\frac{n+1}{2}\right) = \theta(n)$

Problem

Algo1

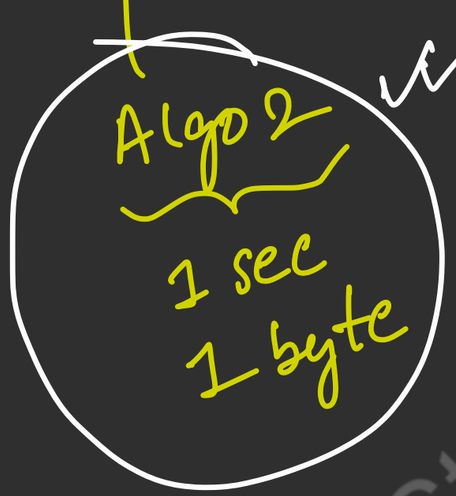
5 sec
10 byte

Algo2

1 sec
1 byte

Algo3.

10 sec
10 byte



For some input $\Omega(1)$
For some input $O(n)$ ← Worst case
For some input $\theta(\frac{n}{2})$

Worst case :

→ Define the input for which the algorithm takes a long time.
→ Input is the one for which the algorithm runs the slowest.

Best case :

→ Define the input for which the algorithm takes the least time.
→ Input is the one for which the algorithm runs the fastest.

Average case :

→ Provide a prediction about the running time of the algorithm.
→ Assume is random.

Follow Now

Start Practicing

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