

A priori Analysis \rightarrow Approximate Results

Time complexity \rightarrow Order of magnitude of a statement.

↳ no of times any statement is executing

Example 1:

main()

$$x = y + z$$

constant (Not dependent on n)

$O(1)$ \neg Asymptotic Notations
 \neg Big O (Worst case)

time complexity)

```
main()
```

$$x = y + z$$

①

 $i > 3$

for i in $\text{range}(0, n)$:

↓ ↓
Loop

$$x = y + z$$
$$\dot{\lambda} = 0$$
$$i = 1 \quad \dots \quad i = n-1$$
$$x = y + z$$
$$x = y + z$$
$$x = y + z$$

3

$n+1$ times

$$\eta = 105550$$

↳ $O(n)$

Example 3:

```
main()
```

$$n = 155555$$
$$x = y + z \quad \text{---} \quad (1)$$

```
for (i=0; i<n; i++)
```

$$\alpha \quad \underline{x = y + z} \quad \underline{\hspace{2cm}}$$

1

```
for (i=0; i<n; i++)
```

$$\alpha \text{ for } (j=0; j < n; j$$
$$\alpha$$
$$x = y + z \quad \text{---}$$

$$1 + n + n^2$$
$$\hookrightarrow O(n^2)$$
$$O(n^2) > O(n) >$$

$O(1)$

(constant)

$i=0$ $\underline{j=0} \quad j=1 \quad j=2 \quad \dots \quad j=n-1$ $x=y+z$		$i=1$ $j=0 \quad j=1 \quad j=2 \quad \dots \quad j=n-1$ $x=y+z$
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$$i < n \Rightarrow i = n-1$$

$$j=0 \quad j=1 \quad \dots \quad j=n-1$$

$$\underline{n=6}$$

$$x=y+z$$