Asymptotic Analysis
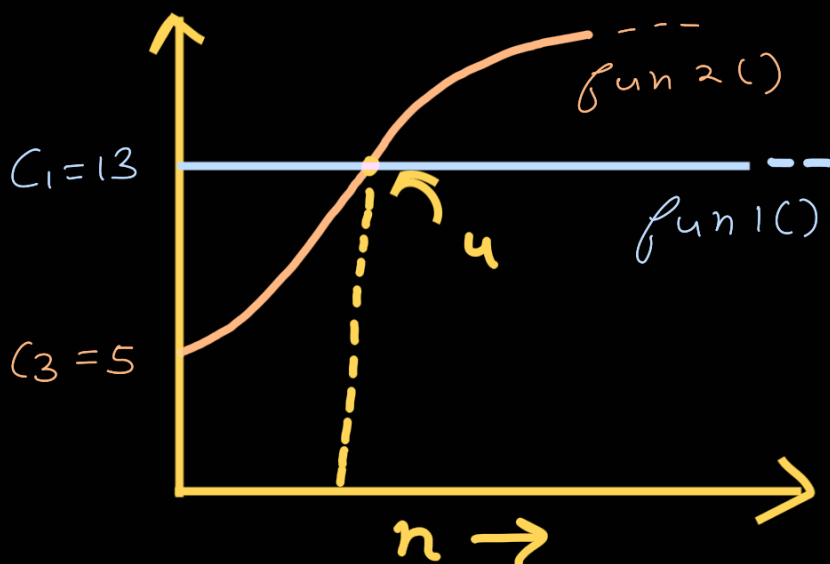
↳ The idea is to measure order of growth.

↳ Does not depend upon machine, programming language, etc.

↳ No need to implement, we can analyze algorithms.

```
int fun1 (int n)
{
    return n * (n+1) ;
                2
}
    Time taken : c_1
```

```
int fun2 ( int n)
{
    int sum = 0;
    for (int i=1; i<=n; i++)
        sum = sum + i;
    return sum;
}
    Time taken :   c_2 n + c_3
```

```
int fun3 (int n)
{
    int sum = 0;
    for (int i=1; i<=n; i++)
    for (int j=1; j<=i; j++)
        sum++ ;
    return sum;
}
```

Time taken : $c_4 n^2 + c_5 n + c_6$

$c_1 = 13$

fun 2()

fun 1()

$c_3 = 5$

$n \rightarrow$

Example values :

$c_1 = 13, c_2 = 2, c_3 = 5$

$fun1() = 13$

$fun2() = 2n + 5$

$13 = 2n + 5$

$\boxed{n = 4}$

Time
taken

$fun\ 3()$

$fun\ 2() = n+1$

$fun\ 1() = 1000$

$n \rightarrow$
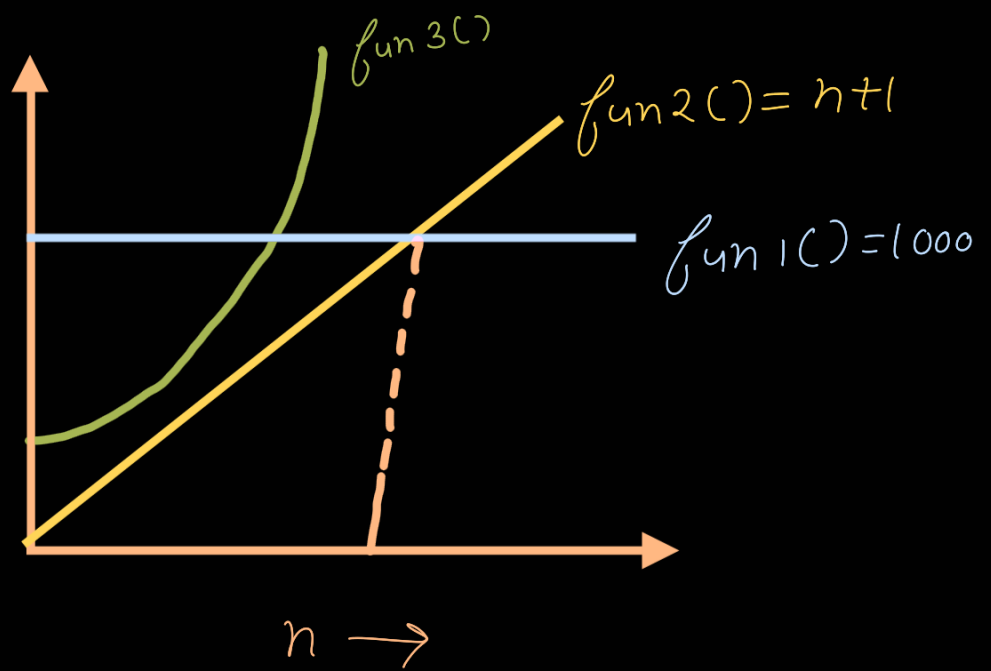
$n + 1 \geq 1000$

$\boxed{n \geq 999}$

, After 999,
$fun\ 2()$ is going
to take more
time