

Functions

~ Selvamani Kannan



Agenda

- Objects & Classes (in short)
- Functions or methods
 - Without arguments
 - With arguments
 - Overloading
- Time complexity
 - Runtime of program
 - Asymptotic notation

Objects & Class

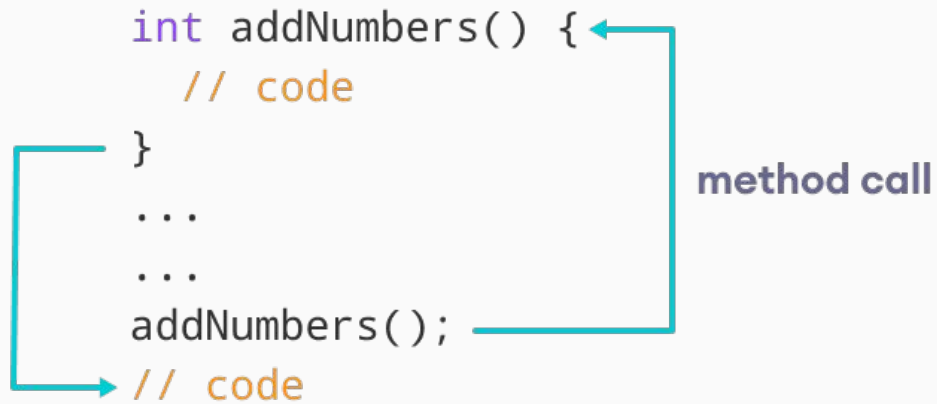
- Object can be any entity, which has its own state or behaviour
- Class is blueprint of object or prototype of object
- **new** keyword
- `className object = new className();`

Methods or Functions

- Set of code gets executed only when particular function is called
 - Methods are written to perform certain set of tasks
 - putBreak in cycle
 - changeGear in cycle
1. Simple functions (void, print)
 2. With arguments
 3. Return type

Methods or Functions

```
int addNumbers() {  
    // code  
}  
...  
...  
addNumbers();  
// code
```



The diagram illustrates a method call. A teal line starts from the `addNumbers();` line in the code block, goes right, then up, then left, ending with an arrow pointing to the opening curly brace of the `addNumbers()` function definition. The text **method call** is placed to the right of this line.

Method overloading

- More than once method having same name, but their parameters or return type is different

```
int myMethod(int x)
float myMethod(float x)
double myMethod(double x, double y)
```

Time Complexity

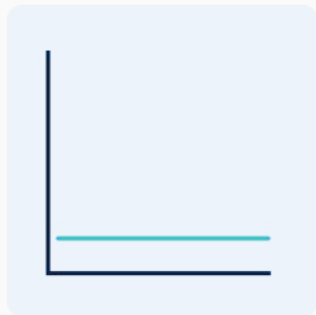
- Which code is better?
- Every line costs one rupee
- Assignment statement = 1

Asymptotic Notations

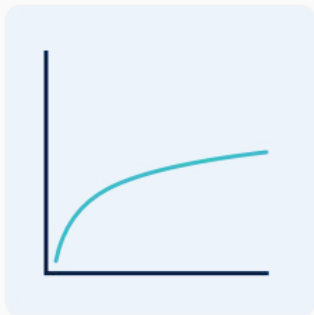
- Defined run time and space of the program
- Big-O - $O(n)$ - worst case
- Omega- Ω - $\Omega(n)$ - best case
- Theta- Θ - $\Theta(n)$ - medium case

Asymptotic Notations

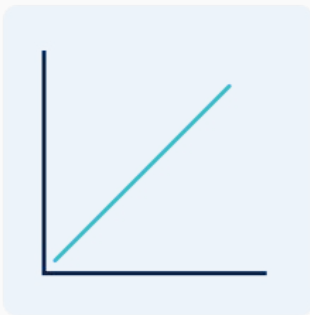
$\Theta(1)$



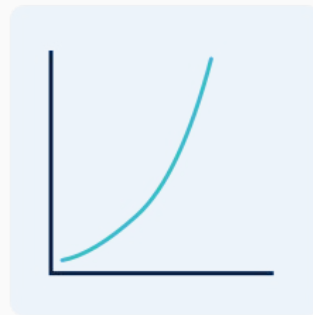
$\Theta(\log N)$



$\Theta(N)$



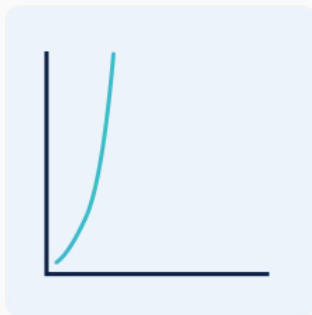
$\Theta(N \log N)$



$\Theta(N^2)$



$\Theta(2^N)$



$\Theta(N!)$



Questions

All the best for Assignments