2nd Dec '21

#90DaysDSA

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Day - 1

Time and Space Complexity

```
for(i=n; i>=1; i=i/2)
  {
    stmt;
  }
```

i	stmt.
n	1
n/2	1

Formulae:

```
for(i=0; i<n; i++)          —— O(n)
for(i=0; i<n; i=i+2)        —— O(n)   n/2 — O(n)
for(i=n; i>1; i--)          —— O(n)
for(i=1; i<n; i=i*2)        —— O(log2 n)
for(i=1; i<n; i=i*3)        —— O(log3 n)
for(i=n; i>1; i=i/2)        —— O(log2 n)
```

If there is a conditional statement, then it may decide diff the number / amount of time.

Time complexity: Time taken by an algorithm as a function of the length of input.

While find Big O notation

* Ignore const. and small powers
* Consider the max power of n.

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$n^2 \log n$

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

Time complexity used for comparing algorithms & analysing which one is better.

O(1) - const. complexity

<ctime> - library in cpp for time stamp/time measure

i	j
0	n
1	n-1
2	n-2
:	:
n	n(n-1)