Some examples of Finding Time complexity

1) for(i=0;i<n;i++) -------------------🡪 n+1

{

for(j=0;j<n;j++) ----------------🡪 n\*(n+1)

{

Statement -----------------------🡪 n\*n

}

}

Ans: O(n2)

|  |  |  |
| --- | --- | --- |
| **i** | **j** | **Stmt no. time** |
| 0 | 0 | 0 |
| 1 | 0 | 1 |
|  | 1 |
| 2 | 0 | 2 |
|  | 1 |
|  | 2 |
| 3 | 0 | 3  .  .  . |
|  | 1 |
|  | 2 |
|  | 3 |
|  | 0 | n |
|  | 1 |
|  | 2 |
|  | .  . |
|  |
|  | n |

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

{

for(j=0;j<i

;j++)

{

Statement

}

}

Ans: O(n2)

|  |  |
| --- | --- |
| i | p |
| 1  2  3  4  .  .  .  .  k | 0+1=1  1+2=3  1+2+3  1+2+3+4  .  .  .  .  1+2+….+k |

3)

p=0;

for(i=1;p<=n;i++)

{

P=p+i;

}

We assume that p>n is stop the condition.

We know that p = 1+2+3+….+k

=k(k+1)/2

There fore k(k+1)/2 > n

K2+k/2 > n

K2 > n

K = O()

Ans: O()

|  |
| --- |
| i |
| 1 |
| 1\*2=2 |
| 2\*2=22 |
| 22\*2=23 |
| .  .  .  2k times |

4) for(i=1; i<n; i=i\*2) {

Statement;

}

i>=n the loop is terminated

i = 2k

2k>=n

2k = n

K = logn

Ans: O(logn)