Time complexity continued…

1.

```
for(int i=0;p<=n;i++){
      p = p+i;
}
```

i	p
0	0
1	0+1
2	0+1+2
3	0+1+2+3
…k	…… 0+1+2+3+4…… k

Termination condition:

k>n **$k^2 > n$**

k(k+1)/2 >n **$k > \sqrt{n}$**

$k^2 + k > n$ **so consider as o($\sqrt{n}$)**

2.

```
for(int i = 1;i<n;i=i*2){
//statement
}
```

i

1*2	2
1*2*2	2^2
1*2*2*2	2^3

…..	….
1*2*2….k	2^k

2^k >=n

log(2^k) = log(n)

$\log_2(2^k) = \log_2(n)$

k = $\log_2(n)$ so consider as o($\log_2 n$)

3.

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

I

n
n/2
$n/2^2$
:
:
$n/2^k$

$n/2^k$ <1

n < 2^k

log n = log 2^k

k = log n

o(log n)