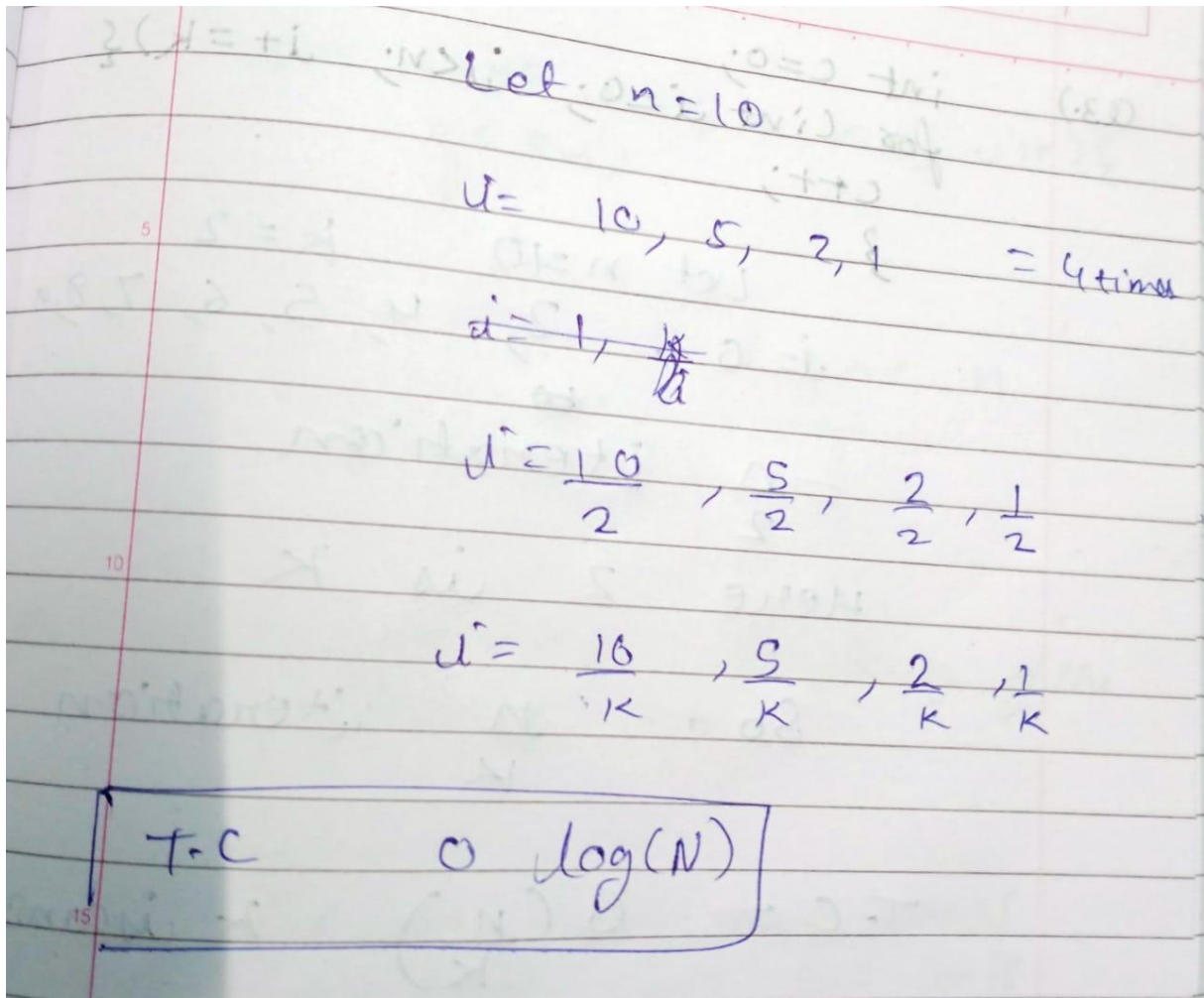




C++ Assignments | Time and space complexity Analysis - 1 | Week 8 ¹.

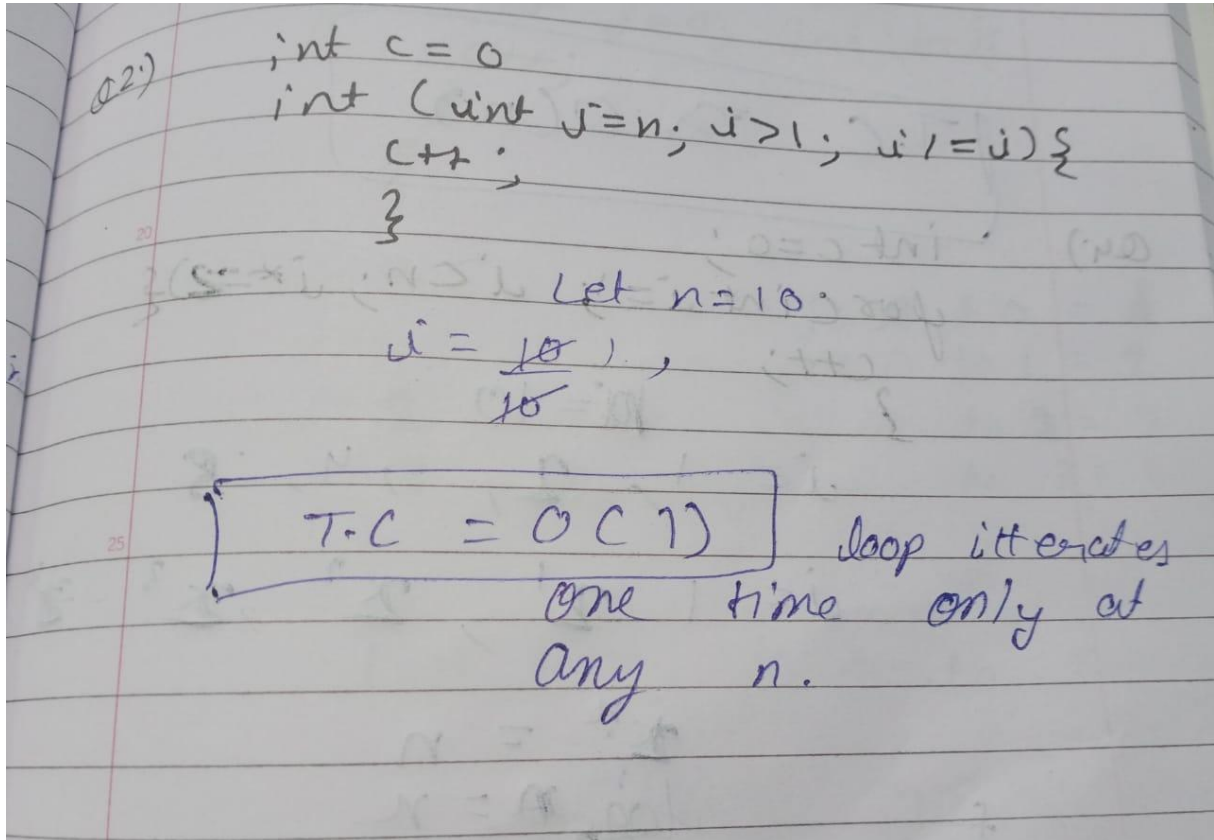
Calculate the time complexity for the following code snippet.

```
int c = 0;
for(int i = n; i > 0; i /= 2) {
    c++;
}
```



2. Calculate the time complexity for the following code snippet.

```
int c = 0;
for(int i = n; i > 1; i /= i) {
    c++;
}
```



3. Calculate the time complexity for the following code snippet where k is some constant ($k < n$).

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

Q3.)

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

Let $n=10$

$i=0, 2, 4, 6, 8$ $k=2$

$= \frac{n}{2}$ iteration

Here 2 is k

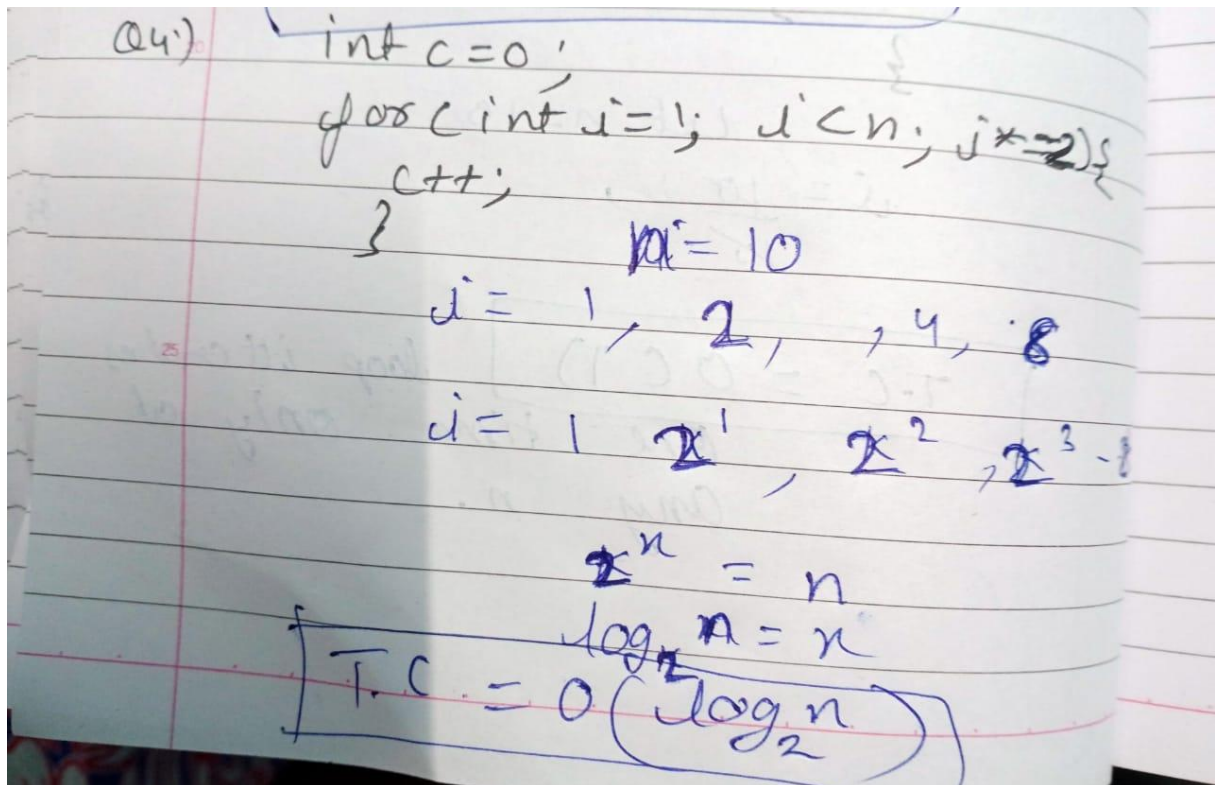
So, $\frac{n}{k}$ iteration

T.C = $O\left(\frac{n}{k}\right)$ k is const

T.C $\Rightarrow O(n)$

4. Calculate the time complexity for the following code snippet.

```
int c = 0;
for (int i = 1; i < n; i *= 2) {
    c++;
}
```

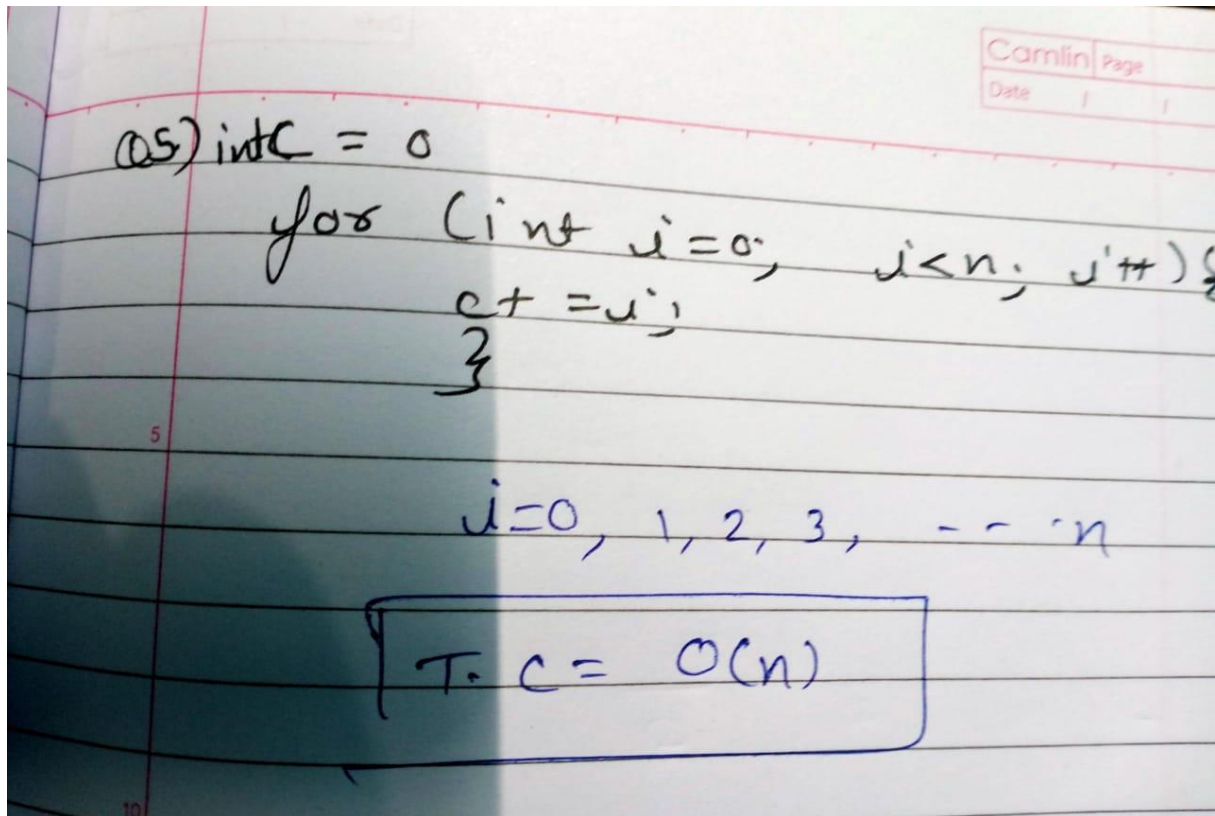


5. Calculate the time complexity for the following code snippet.

```

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

```



6. Calculate the time complexity for the following code snippet.

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


26.) Calculate time complexity of the following code

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

i = 0

i = 1

i = 2

i = 3

⋮

⋮

i = n

j = 0 to 0 = 1

j = 0 to 1 = 2

j = 0 to 2 = 3

j = 0 to 3 = 4

j = 0 to n = $\frac{n+1}{2}$ time

$O(n \times n)$
 ~~$= O(n^2)$~~

T.C $\frac{n(n+1)}{2}$
 T.C $\approx O(n^2)$

Note:- Please try to invest time doing the assignments which are necessary to build a strong foundation. Do not directly Copy Paste using Google or ChatGPT. Please use your brain 😊.