

Name: ADVAIT CHAVAN, Mail-id : [advaitchavan135@gmail.com](mailto:advaitchavan135@gmail.com)

Contact no: +91 7021455852

## Assignment 1 | 5th August 2021

### Question 1

What is the time complexity  $T(n)$  for the following code snippet?

```
a = 1
b = 1
while(b <= n)
{
    a += 1
    b += 1
    cout<<"Hi";
}
```

Solution : Initially a and b are given values 1 and 1 respectively. Since  $1 \leq n$ , a and b will be increased by +1 and "Hi" would be printed for 'n' number of times.

If we set value of  $n=3$ , "Hi" would be printed for 3 times.

So the time complexity  **$T(n)=O(n)$  [Linear time Complexity]**

### Question 2

Write the output for the following recursive code snippet for  $n = 3$ :

```
void fun(int n)
{
    if(n > 0)
    {
        cout<<n:
        fun(n - 1);
        cout<<n;
    }
}
```

Solution : The entire program is given by:

```
#include <iostream>
```

```
using namespace std;
```

```
void fun(int n)
```

```
{
```

```
    if(n > 0)
```

```
    {
```

```
        cout<<n;
```

```
        fun(n - 1);
```

```
        cout<<n;
```

```
    }
```

```
}
```

```
int main()
```

```
{
```

```
    fun(3);
```

```
    return 0;
```

```
}
```

Output: The output for the given program is **321123**

```
1
2 #include <iostream>
3
4 using namespace std;
5
6 void fun(int n)
7 {
8     if(n > 0)
9     {
10         cout<<n;
11         fun(n - 1);
12         cout<<n;
13     }
14 }
15
16 int main()
17 {
18     fun(3);
19     return 0;
20 }
21
22
```

321123

...Program finished with exit code 0  
Press ENTER to exit console.

