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:

In the given code snippet a=1, b=1 and we are given a while loop.

Each of assignment statements and other operations except the loop, is of constant time complexity.

Now for the loop we have

While(b<=n)

{ a+=1

b+=1

cout<<”Hi”;

}

For each value of b starting from 1 and the loop will execute until b<n . Hence it will execute n times .

Suppose n=3

b=1 will execute and enter the loop where the value of b will be changed to 2.

Second time we will enter the loop with the value of b as 2 and inside it will be incremented to 3.

Third time we will enter the loop with the value of b as 3 and inside it will change to 4.

Next time the condition will become false and we will not enter the loop and the statements inside the loop will not be executed.

Hence the statements were executed 3 times that is equal to n.

Hence the time complexity for the above code snippet will be O(n).

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 :

Given to us that n=3

First time the function will be called with n=3

Inside the function we check the condition n>0 which is true as 3>0.

Then the print statement is excuted and 3 will be printed.

Next statement is a recursive call to the function with n=3-1=2

Next time we enter the function with n as 2.

Again condition is checked and 2 is printed as condition is true.

Next time the recursive call is done with n=2-1=1

Again we enter the function and the condition is true and 1 is printed.

But next time the function call is given with n=1-1=0 and condition becomes false.

Then it print 1 , 2 and 3.

Hence the output will be :

3 2 1 1 2 3

|  |
| --- |
| Day-1 Assignment |
|  | 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: T(n) = O(n) |
|  | Since it is increasing linearly |
|  |  |
|  | 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: |
|  | //Program:- |
|  | #include <iostream> |
|  | using namespace std; |
|  | void fun(int n) |
|  | { |
|  | if(n > 0) |
|  | { |
|  | fun(n - 1); |
|  | cout<<n; |
|  | } |
|  | } |
|  | int main() |
|  | { |
|  | fun(3); |
|  | return 0; |
|  | } |
|  |  |
|  | //Output: |
|  | 123 |