Data Structures and Algorithms Essential Program

DAY-1 | ASSIGNMENT-1

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1.) Find the time complexity for the following scenarios

a.) for(i=1;i<=n;i++)
for(j=i;j<=n;j++)
printf("Hi");

sol.) Say,n=3
In the outer for loop n value is 3 and i value starts from 1.therefore the condition is true so the control goes to the inner for loop.
Inner for loop starts from 1 and iterates for 3 times and prints hi for 3 times and exits the loop when i=4.
In the 2nd iteration of outer for loop,i=2,n=3.condition is true so the control goes to the inner for loop.
Inner for loop starts from 2 and iterates until n=3 and prints hi for 2 times and exits the loop when i=4.
This goes on until n=3.
Therefore the total number of hi is 6 and number of outer for loop iterations are 3
The time complexity is **O(n!)**.

b.) for(i=1;i<=n;i*=3)
for(j=1;j<=n;j++)
printf("Hello");
sol.) say n=3
The outer for loop initially has the values n=3,i=1.
In 1st iteration of outer loop the condition is true so the control goes to inner loop.
In inner loop hello is printed for 3 times and when n=4 the loop exits and control goes to outer loop.
In the 2nd iteration of outer loop n =3,i=3.the condition is true so the control goes to inner loop.
In inner loop hello is printed for 3 times and when n=4 the loop exits and control goes to outer loop.
Therefore the time complexity is **O(nlogn)**.