Question 1

1.) Find the time complexity for the following scenarios

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

The outer for loop , for(i=1;i<=n;i++) runs **n** times.

The inner for loop runs for(j=i;i<=n;j++) runs **n-i+1,** i.e. n, n-1, n-2, n-3 ….. 3,2,1. The sum is n\*(n-1)/2. Therefore, the time complexity is given by O(n\*(n-1)/2) or O().

Time Complexity: O()

b)

|  |
| --- |
| for(i=1;i<=n;i\*=3) for(j=1;j<=n;j++) printf("Hello"); |

The outer for loop has a time complexity of as **i** is being tripled at every iteration.

The inner for loop runs **n** times for every iteration of the outer for loop. Therefore, time complexity of the loop is O(n).

The Overall time complexity of the algorithm is .

Time Complexity: