**Assignment-1**

**Qus-1: Find the time complexity for the following scenarios**

**a.)** for(i=1;i<=n;i++)

for(j=i;i<=n;j++)

printf("Hi");

**Ans:** first loop will run nth time and inner loop will also run nth times.

|  |  |
| --- | --- |
| **outer loop i**  **iteration** | **Inner loop j**  **iteration** |
| 1 | n |
| 2 | n |
| 3 | n |
| . | . |
| . | . |
| n | n |

So, the time complexity = O(n2)

**b.)** for(i=1;i<=n;i\*=3)

for(j=1;i<=n;j++)

printf("Hello");

**Ans**:

|  |  |  |
| --- | --- | --- |
| **i** | **Increment** |  |
| 1 | 1\* 3 = 3 | 31 |
| 3 | 3\* 3 = 9 | 32 |
| 9 | 9 \* 3= 27 | 33 |
| . | . | . |
| . | . | . |
| n | . | 3kth |

Now 3k steps will take to perform the operation.

now k = log3(n);

we get, 3loge(n) which is n.

Hecne Time complexity = O(logn) ;