**ASSIGNMENT – DAY-1**

**Q1. What is the time complexity of the following code:-**

**int a=0;**

**for(int i=0 ; j<n ; i++)**

**{**

**for(int j=n ; j>I ; j--)**

**{**

**a=a+i+j;**

**}**

**}**

**Answer**

The above code runs total no of times

= N + (N – 1) + (N – 2) + … 1 + 0

= N \* (N + 1) / 2

= 1/2 \*N 2 + 1/2 \* N

O(N2) times.

**2. for(int i=1; i<=n ;i\*2)**

**{**

**for(int j=1; j<=i;j++)**

**{**

**count=count+1;**

**}**

**}**

**Answer**

Since this is a nested loop so, time complexity

O(log n) x O(n)= O(nlog n)

**3 Find the best case , worst case & average case of linear search algorithm.**

#include <bits/stdc++.h>

using namespace std;

// Linearly search x in arr[].

// If x is present then return the index,

// otherwise return -1

int search(int arr[], int n, int x)

{

int i;

for (i = 0; i < n; i++) {

if (arr[i] == x)

return i;

}

return -1;

}

int main()

{

int arr[] = { 1, 10, 30, 15 };

int x = 30;

int n = sizeof(arr) / sizeof(arr[0]);

cout << x << " is present at index "

<< search(arr, n, x);

getchar();

return 0;

}

**Worst Case Analysis:- O(n).**

**Average case Analysis:-**

analysis1

analysis2

= O(n)

**Best Case Analysis :-O(1)**