**INSERTION SORT PROJECT**

**A-**[22,27,16,2,18,6] -> Insertion Sort

**A.1-)** Insertion Sort Steps:

[**22**,27,16,2,18,6] n

[2,**27**,16,22,18,6] n-1

[2,6,**16**,22,18,27] n-2

[2,6,16,**22**,18,27] n-3

[2,6,16,18,**22**,27] 1

**A.2-)** Big O Notation :

The formula for summation of the natural numbers from 1 to n :

In Big O notation, we ignore the coefficients and choose the dominant term, so the Big O notation should be O(n2)

**A.3-)** Time Complexity :

Best case: O(n)

Average case: O(n2)

Worst case: O(n2)

**A.4-)** After the array has been sorted, which case does the number 18 belong to?

After the insertion sort-> [2,6,16,18,22,27]

Because it is located in the middle parts of the array, the number 18 is included in the average case.

**B-)** [7,3,5,8,2,9,4,15,6]

**Question B.1-)**

The First Insertion Sort Steps:

[**7**,3,5,8,2,9,4,15,6] n

[2,**3**,5,8,7,9,4,15,6] n-1

[2,3,**5**,8,7,9,4,15,6] n-2

[2,3,4,**8**,7,9,5,15,6] n-3

[2,3,4,5,**7**,9,8,15,6] n-4