Introduction to Algorithm Design
HW5 Report

Question 1:

In this part I design a dynamic programming algorithm that takes values for n, M, and sequences of operating costs “N1 ..... Nn” and “Sl .....Sn” , and returns the cost of an optimal plan. First I create 2 array which size is equal to NY and SF and assign 0 all element of these arrays. After that I checked other citys (cost + M) is smaller than the current city cost. If its small assign other city cost + M to array. This calculation continue to end of list. End of the for loop we find optimal plan and return that value.

Complexity :

There is one loop in function. This function turns n time for every input so its time complexity is O(n)

Question 2:

In this part function take 2 array, one of them is start hour, the other one is finish hour of sessions. First I sort two array according to finish hours array. After that I start from first index of start array. If the sessions start time is equals or greater then the previous session finish time, I print it on screen.

Complexity :

I use python sort so it takes O(n log n) time to sort the sessions according to finish time. There is one loop in alorithm. This loop turn n time and each takes constant time. So complexity is O(n + nlogn) => O(n log n).

Question 3:

In this algoritho Im we search for subarry which is sum equal to zero. Find all subset algorithm complexity is O(2^n). So I design dynamic algorithm. In this algorithm fonction stop the program when it finds the sum.

Complexity :

Time complexity of this algorithm is O(n * sum)

n = number of the element

sum = sum of all the element.

Question 4:

Complexity
x = first strings length
y = second strings length

For loop turns x * y times. While loop turn x + y times in worst case. Time complexity is O(x*y).

Question 5:

I create two array for calculation. Because it can changeable for negative values. I append all items of input array to these two array for checking their sings. After that I start a while loop for sum these two arrays elements. After that loop I start another loop to finish array elements. At the end we find min operation number.

Complexity :

I use python sort so it takes O(n log n) time to sort the sessions according to finish time. Tm. While loop turns n time. N is size of array. So complexity is O(n + nlogn) => O(n log n).