Amazon Interview Problems

1) Write an efficient program for printing k largest elements in an array. Elements in array can be in any order.

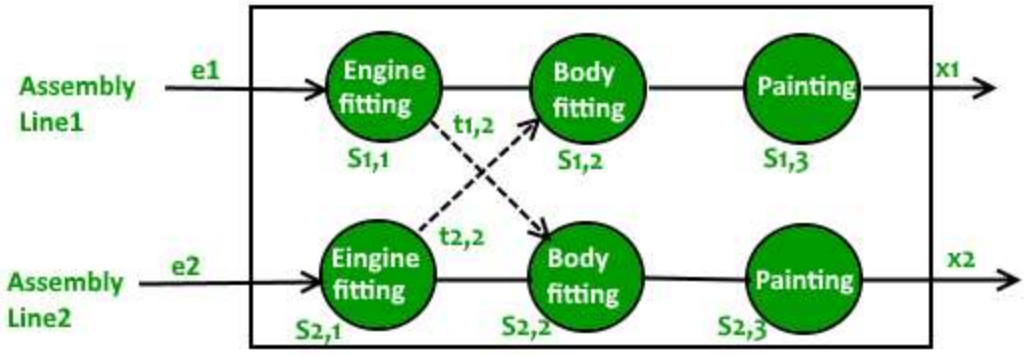
For example, if given array is [1, 23, 12, 9, 30, 2, 50] and you are asked for the largest 3 elements i.e., k = 3 then your program should print 50, 30 and 23.

2) The stock span problem is a financial problem where we have a series of n daily price quotes for a stock and we need to calculate span of stock's price for all n days.

The span Si of the stock's price on a given day i is defined as the maximum number of consecutive days just before the given day, for which the price of the stock on the current day is less than or equal to its price on the given day.

For example, if an array of 7 days prices is given as {100, 80, 60, 70, 60, 75, 85}, then the span values for corresponding 7 days are {1, 1, 1, 2, 1, 4, 6}

3) A car factory has two assembly lines, each with n stations. A station is denoted by Si,j where i is either 1 or 2 and indicates the assembly line the station is on, and j indicates the number of the station. The time taken per station is denoted by ai,j. Each station is dedicated to some sort of work like engine fitting, body fitting, painting and so on. So, a car chassis must pass through each of the n stations in order before exiting the factory. The parallel stations of the two assembly lines perform the same task. After it passes through station Si,j, it will continue to station Si,j+1 unless it decides to transfer to the other line. Continuing on the same line incurs no extra cost, but transferring from line i at station j – 1 to station j on the other line takes time ti,j. Each assembly line takes an entry time ei and exit time xi which may be different for the two lines. Give an algorithm for computing the minimum time it will take to build a car chassis.



4) A message containing letters from A-Z is being encoded to numbers using the following mapping:

'A' -> 1

'B' -> 2

...

'Z' -> 26

Given an encoded message containing digits, determine the total number of ways to decode it.

Input Format:

The first and the only argument is a string A.

Output Format:

Return an integer, representing the number of ways to decode the string.

Constraints:

1 <= length(A) <= 1e5

Example:

Input 1:

A = "8"

Output 1: 1

Explanation 1:

Given encoded message "8", it could be decoded as only "H" (8).

The number of ways decoding "8" is 1.

Input 2:

A = "12"

Output 2:

2

Explanation 2:

Given encoded message "12", it could be decoded as "AB" (1, 2) or "L" (12).

The number of ways decoding "12" is 2.

5) Given a list, rotate the list to the right by k places, where k is non-negative.

For example:

Given 1->2->3->4->5->NULL and k = 2,

return 4->5->1->2->3->NULL.

6) Given an array and a value, remove all the instances of that value in the array.

Also return the number of elements left in the array after the operation.

It does not matter what is left beyond the expected length.

Example:

If array A is [4, 1, 1, 2, 1, 3]

and value element is 1,

then new length is 3, and A is now [4, 2, 3]

Try to do it in less than linear additional space complexity.

7) There is a total of A courses you have to take, labeled from 1 to A.

Some courses may have prerequisites, for example to take course 2 you have to first take course 1, which is expressed as a pair: [1,2].

Given the total number of courses and a list of prerequisite pairs, is it possible for you to finish all courses?

Return 1 if it is possible to finish all the courses, or 0 if it is not possible to finish all the courses.

Input Format:

The first argument of input contains an integer A, representing the number of courses.

The second argument of input contains an integer array, B.

The third argument of input contains an integer array, C.

Output Format:

Return a Boolean value:

1: If it is possible to complete all the courses.

0: If it is not possible to complete all the courses.

Constraints:

1 <= A <= 6e4

1 <= length(B) = length(C) <= 1e5

1 <= B[i], C[i] <= A

Example:

Input 1:

A = 3

B = [1, 2]

C = [2, 3]

Output 1:

1

Explanation 1:

It is possible to complete the courses in the following order:

1 -> 2 -> 3

Input 2:

A = 2

B = [1, 2]

C = [2, 1]

Output 2:

0

Explanation 2:

It is not possible to complete all the courses.