

Questions-

Question-1

Check AB

Suppose you have a string made up of only 'a' and 'b'. Write a recursive function that checks if the string was generated using the following rules:

- a. The string begins with an 'a'
- b. Each 'a' is followed by nothing or an 'a' or "bb"
- c. Each "bb" is followed by nothing or an 'a'

If all the rules are followed by the given string, return true otherwise return false.

Sample Input:

abb

Sample Output:

true

Question-2

Staircase

A child is running up a staircase with N steps, and can hop either 1 step, 2 steps or 3 steps at a time. Implement a method to count how many possible ways the child can run up to the stairs. You need to return number of possible ways W.

Input format :

Line 1 : Integer N (No. of steps)

Output Format :

Line 1 : Integer W i.e. Number of possible ways

Constraint :

(1 <= N <= 30)

Sample Input 1:

4

Sample Output :

7

Question-3

Binary Search (Recursive)

Given an integer sorted array (sorted in increasing order) and an element x, find the x in given array using binary search. Return the index of x.

Return -1 if x is not present in the given array.

Note : If given array size is even, take first mid.

Input format :

Line 1 : Array size

Line 2 : Array elements (separated by space)

Line 3 : x (element to be searched)

Sample Input :

6

2 3 4 5 6 8

5

Sample Output:

3

Question-4

Return subset of an array

Given an integer array (of length n), find and return all the subsets of input array in the form of a 2-d array.

Subsets are of length varying from 0 to n, that contain elements of the array. But the order of elements should remain same as in the input array.

Note : The order of subsets are not important.

Input format :

Line 1 : Size of array

Line 2 : Array elements (separated by space)

Sample Input:

3

15 20 12

Sample Output:

[] (this just represents an empty array, don't worry about the square brackets)

12

20

20 12

15

15 12

15 20

15 20 12

Question-5

Print Subset Sum to K

Given an array A and an integer K, print all subsets of A which sum to K.

Subsets are of length varying from 0 to n, that contain elements of the array. But the order of elements should remain same as in the

input array.

Note : The order of subsets are not important. Just print them in different lines.

Input format :

Line 1 : Size of input array

Line 2 : Array elements separated by space

Line 3 : K

Sample Input:

9

5 12 3 17 1 18 15 3 17

6

Sample Output:

3 3

5 1

Question-6

Print all Codes - String

Assume that the value of a = 1, b = 2, c = 3, ... , z = 26. You are given a numeric string S. Write a program to print the list of all possible codes that can be generated from the given string.

Note : The order of codes are not important. Just print them in different lines.

Input format :

A numeric string S

Output Format :

All possible codes in different lines

Constraints :

1 <= Length of String S <= 10

Sample Input:

1123

Sample Output:

aabc

kbc

alc

aaw

kw

Question-7

Print Permutations - String

Given a string, find and print all the possible permutations of the input string.

Note : The order of permutations are not important. Just print them in different lines.

Sample Input :

abc

Sample Output :

abc

acb
bac
bca
cab
cba

Question-8

Strings of Length k

Given a string S and an integer k, you need to find all the possible strings that can be made of size k using only characters present in string S.

The characters can repeat as many times as needed.

Note 1 : The number of output strings can be at max 1000.

Note 2 : Order of strings in not important.

Input format :

S and k (separated by space)

Constraints :

$1 \leq \text{Length of String } S \leq 10$

$1 \leq k \leq 5$

Sample Input 1 :

abc 2

Sample Output 1 :

aa
ab
ac
ba
bb
bc
ca
cb
cc