Practice Questions for You

1) Sahil, Mayank and Satyam are playing Clash of Clans. They are part of same clan. In a clan war, they are debating on the topic that how many clans should they attack then. So, they decided to decide the number of attacks by a computer program. They approach you for help. You have been given an array of integers and your task is to find the longest increasing subsequence of array. The length of that subsequence will be **len**. The number of attacks would then be decided by **len%6.**

e.g.:

Input: 14 23 51 34 53 67 89 43

Output: 4

Explanation: 34 53 67 89 is the longest increasing subsequence.

2) Gyanesh and Saif were once playing truth or dare game. Gyanesh was bored of the simple bottle rotation method and wanted to try something new. They decided to play it using software which outputs either **T** or **D** (strange ideas). So, you will be provided with two strings. If those two strings can be made equal to each other by rotating characters then output will be **D** otherwise it will output **T**.

e.g.:

Input: shift tfifs

Output: D

Explanation: Since both have same letters so they can be made same, so its D.

3) Pooja was once making noodles for me, Satyam, Abhishek (Midu) and Nikhil. And as she is notoriously famous for making it spicy, we were worried. So, we all decided to calculate the spiciness factor by a computer program and that would be followed while making noodles. So, the factor scales from 0 to 10. So, you would be provided with an array of integers and your task is to find out the number of pairs whose sum equals to a number provided by the user. The spiciness factor would be decided by the remainder obtained on dividing number of pairs by 11 (np%11).

e.g.:

Input: 3 6 1 8 4 7 5 9 2 8 and target number is 9

Output: 4

Explanation: (3, 6), (4, 5), (1, 8), (2, 7)

4) Shubham gave Anmol one coding problem to solve which he indeed solves. Now, for testing he goes to his friends, Anshi and Poorvi. He tells both to choose any two numbers and they both chose their favorite number. Anmol used those number as inputs and got the output as distance between those integers in the array of integers provided to you. So, you have been given an array of integers and your task is to find the minimum distance between the two integers provided by Anshi and Poorvi. If integers don't exist in array then print -1.

e.g.:

Input: {56, 51, 12, 90, 25, 83} Anshi – 51 Poorvi – 25

Output: 3

Explanation: Since 51 is at index 1 and 25 is at index 4 so distance between them is 3.

5) Abhishek, a programming enthusiast who began coding is enjoying it a lot! Now, he decides to select a lucky number for himself and that number, he will decide by a program (coders can be really crazy at times!!). So, he decides to take an array of integers from Vani, his friend and then run his program using the array as input. The lucky number is the number which occurs more than N/2 times in the array, where N is the length of array.

Assumption: Each array will have a majority element.

e.g.:

Input: {2, 1, 2, 5, 2}

Output: 2

Explanation: Since 2 occurs 3 times which is greater than 5/2 times.

6) Shauray creates a program which he eagerly wants to test. So, he goes to his friends Ashi and Bhavishya for inputs. Both of them were asked to provide a string each. The task for Shauray's program is to count the number of distinct subsequences of sequence by Ashi to form a sequence identical to sequence of Bhavishya.

Assumption: Every case will have at least 1 subsequence.

e.g.:

Input: rabbbit and rabbit

Output: 3

Explanation: ra_bbit, rab_bit, rabb_it are 3 ways to form the subsequence. _ represents the removed character.

7) Sagar and Twinkle are helping Anmol with a program he is solving. Anmol wants them to give inputs for his program to run. They help him in building different testcases. So, Anmol asks Sagar and Twinkle to provide inputs. Sagar has to provide a string **A** and Twinkle needs to provide Anmol with a dictionary of words **B**, the program needs to determine if A can be segmented to space separated sequence of one or more dictionary words.

Return either 0 or 1, 0 for not possible and 1 for possible.

e.g.:

Input: GirdharplayswithDev and {Girdhar, Dev, plays, how, with, Anmol, coding}

Output: 1

Explanation: Since the input string can be broken into different words which are in dictionary so it's possible.

8) Ayush, the smartest kid of the Factory Colony, is notorious too! So, once he decided to play cricket with Bhoomi, Dev, Girdhar and Anmol. But since Ayush was notoriously smart, he decides to bias the coin. The new probability of getting heads on tosses by different biased coins are stored in an integer array of odd length N which is provided to you. Your task is to find the probability of getting heads more than tails.

e.g.:

Input: {0.3, 0.4, 0.7}

Output: 0.442

Explanation: Since the probability of getting tails is (1 – prob. of getting heads) so, for heads greater than tails, there are 4 possibilities: -

P ({head, head, tail}) = 0.3 x 0.4 x (1 – 0.7) = 0.036

P ({tail, head, head}) = (1 – 0.3) x 0.4 x 0.7 = 0.196

P ({head, tail, head}) = 0.3 x (1 – 0.4) x 0.7= 0.126

P ({head, head, head}) = 0.3 x 0.4 x 0.7 = 0.084

Adding the above probabilities

0.036 + 0.196 + 0.126 + 0.084 = 0.442

9) Kartikaya has a knack of coding in him. He decides to build a great program and thus needed someone to make test cases for the question. He contacted Divyanshu for this purpose. He asked Divyanshu to provide him with an array of strings. He made a program which finds out the longest common prefix of all the strings in the array. Print the longest common prefix.

e.g.:

Input: {ditqwr, ditqwtyr, ditgri, ditkit}

Output: dit

Explanation: dit is the common prefix for all the strings of the array.

10) Anmol and Arnab are managing SCS Library at Aryabhatta Hostel, IIT BHU. They have an integer array A of size N which consists of number of pages in each book and an integer B which denotes the number of students who are willing to take books. In those N books, the ith book has A[i] number of pages. Anmol and Arnab need to allocate books to those B students so that maximum number of pages allocated to a single student is minimum. They can allocate a book to only one person and each student should receive at least one book. Allotment should be done in contiguous order i.e. a student cannot be allocated book number 1 and 3 skipping 2. Return the minimum possible number. Return -1 if no such possibility exists.

e.g.:

Input: A = [12, 23, 45, 34] B=2

Output: 79

Explanation: Books can be distributed in following ways:

[12] and [23, 45, 34] so max pages allocated to a student = 102

[12, 23] and [45, 34] so max pages allocated to a student = 79

[12, 23, 45] and [34] so max pages allocated to a student = 80

So, we get maximum number of pages allocated to a single student is minimum is at 79.

11) Nikhil and Satyam started coding. Great to see new coders! They want to solve a question. So, Satyam and Nikhil together built a great program which took input as an array of strings and gave the length of smallest string which contains all the strings in the set as substring.

e.g.:

Input: {abcd, rtyu, abce, bcdf}

Output: abcdefrtyu

Explanation: This string contains all the strings of the set as substring.

12) Abhishek (Midu) is celebrating his birthday. He has invited all his friends to the party. But since some friends are closer than others, he devised a rating system for his friends. The friend with a higher rating will be getting higher candies than their neighbors. Each friend must get at least 1 candy. You are given an array of integers which signifies the ratings of each friend.

Calculate the minimum amount of candies Midu must give to his friends.

e.g.:

Input: [1, 4, 2, 1]

Output: 7

Explanation: Candies given are [1, 3, 2, 1]. Midu must give 1 candy to the first friend since his rating is lower than the next one. The next friend has higher rating than both his neighbors so he must get more chocolates while 3^{rd} friend has more rating than 4^{th} so he must get more than 4^{th} friend. So, Midu give 3 candies to 2^{nd} friend and then 2 to the 3^{rd} friend and 1 to 4^{th} friend.

13) Pulkit, who is working as a manager for a start up product, has to handle advanced booking of the products. He made a booking portal which shows number of products up for issuing but does not show the condition of its availability on that particular day (confused boy, right!!) He has K products. He got N advance bookings. He has been given 2 integral integers. First integral array signifies the date of issuing the product and the second integral array denotes the date of return. Integer K denotes number of products. So, return either 0 or 1, 0 denoting there will not be enough products for issuing while 1 denotes Pulkit can issue products without any mistake.

So, your task is to help Pulkit see whether it is manageable or not.

e.g.:

Input: Arrival: [1, 3, 5] Departures: [2, 4, 7] K=1

Output: 0

Explanation: Since at Day 5, the slot is already booked but you have a second advanced booking too!

14) Anubhav is solving a permutation problem. Since he is short of time and feeling little lazy, he decides to take help of a computer program for help. So, he makes a program which takes the input as a string and then returns the rank of the string amongst its permutations sorted lexicographically.

e.g.:

Input: acb

Output: 2

Explanation: The ordered permutations with letters ‘a’, ‘b’ and ‘c’ are

abc

acb

bac

bca

cab

cba

So, acb is in the 2nd position. The answer might not fit in an integer so return answer%1000003.

15) Satyam is creating a new program. He wants the program to take input in form of an integer and return a string as output which will be the reversed string word by word.

NOTE:

1. A sequence of non-space characters constitutes a word.
2. Your reversed string should not contain leading or trailing spaces, even if it is present in the input string.
3. If there are multiple spaces between words, reduce them to a single space in the reversed string.

e.g.:

Input: “Shubham is a coder”

Output: “coder is a Shubham”

16) Nikhil wants to create a program which would help him sort n colored objects. So, he takes input in form of an integral array of n objects which consists of color codes.

Return the sorted array with same colored objects together to help Nikhil.

e.g.: Here we are taking integers 0, 1, 2 in form of Red, white and blue.

Input: [0, 1, 2, 1, 0, 2]

Output: [0, 0, 1, 1, 2, 2]

17) Ansh is working at a counter and he has a set of coins S. Ansh is going to solve the problem which will tell in how many ways you can make sum N assuming Ansh has infinite amount of each type of coin in the set.

Coin in set S will be unique. We expect a space complexity of O(N).

Input:

S = [1, 2, 3]

N = 4

Output: 4

Explanation: The 4 possible ways are

{1, 1, 1, 1}

{1, 1, 2}

{2, 2}

{1, 3}

Give the answer as answer%1000007.

18) Divyanshu is now going to invest in stock market after getting inspirations from a movie. The cost of stock on each day has been provided to Divyanshu by Arnab in an array of size N. Since, Divyanshu wants to earn profits he takes help from Shubham and Anmol to make a program which can find all the days on which Divyanshu buys and sell the stock so that in between those days, Divyanshu's profit is maximum. So, he provides number of days and array to us and the program returns all the days with profits in a single line and if no profit print "No Profit".

e.g.:

Input:

10

23 13 25 29 33 19 34 45 65 67

Output:

(1 4) (5 9)

19) Satyam and Nikhil were solving Mathematics problem and after solving many problems they got bored! To have some enjoyment they thought of doing some coding (new coders!!). They wrote a program which took string S as input and returns longest substring with all distinct characters.

e.g.:

Input: abababcdefababcdab

Output: 6

Explanation: abcdef