

### Question 1

An automobile company manufactures both a two-wheeler (TW) and a four-wheeler (FW). A company manager wants to make the production of both types of vehicle according to the given data below:

- 1st data, Total number of vehicle (two-wheeler + four-wheeler)=v
- 2nd data, Total number of wheels = W

The task is to find how many two-wheelers as well as four-wheelers need to manufacture as per the given data.

Example :

Input :  
200 -> Value of V  
540 -> Value of W

Output :  
TW =130 FW=70

Explanation:

$130+70 = 200$  vehicles  
 $(70*4)+(130*2)= 540$  wheels

Constraints :

- $2 \leq W$
- $W \% 2 = 0$
- $V < W$

Print “INVALID INPUT” , if inputs did not meet the constraints.

The input format for testing

The candidate has to write the code to accept two positive numbers separated by a new line.

- First Input line – Accept value of V.
- Second Input line- Accept value for W.

The output format for testing

Written program code should generate two outputs, each separated by a single space character (see the example)

## Question 2

A chocolate factory is packing chocolates into the packets. The chocolate packets here represent an array of N number of integer values. The task is to find the empty packets (0) of chocolate and push it to the end of the conveyor belt(array).

Example 1 :

N=8 and arr = [4,5,0,1,9,0,5,0].

There are 3 empty packets in the given set. These 3 empty packets represented as 0 should be pushed towards the end of the array

Input :

8 – Value of N

[4,5,0,1,9,0,5,0] – Element of arr[0] to arr[N-1], While input each element is separated by newline

Output:

4 5 1 9 5 0 0 0

Example 2:

Input:

6 — Value of N.

[6,0,1,8,0,2] – Element of arr[0] to arr[N-1], While input each element is separated by newline

Output:

6 1 8 2 0 0

### Question 3

Josh went to the market to buy N apples. He found two shops, shop A and B, where apples were being sold in lots. He can buy any number of the complete lot(s) but not loose apples. He is confused with the price and wants you to figure out the minimum cost to buy exactly N apples. Write an algorithm for Josh to calculate the minimum cost to buy exactly N apples.

Input Format:

- The first line of the input consists of an integer – N, representing the total number of apples that Josh wants to buy.
- The second line consists of two space-separated positive integers – M1 and P1, representing the number of apples in a lot and the lot's price at shop A, respectively.
- The third line consists of two space-separated positive integers-M2 and P2, representing the number of apples in a lot and lot's price at shop B, respectively.

Output Format:

Print a positive integer representing the minimum price at which Josh can buy the apples.

Sample Input:

19

3 10

4 15

Sample Output:

65

### Question 4

Write a program to implement a bubble sort algorithm for sorting the elements of an array. We are given with a array of N elements and we need to sort them in ascending order. But in this question we need to use Bubble sort, to sort the given array.

Input Format:

- The first line corresponds to the size of an array.
- The second line corresponds to the elements.

Output Format:

Print the N elements of the array in ascending order.

Sample Input:

6

11 15 26 38 9 10

Sample Output:

9 10 11 15 26 38

Explanation :

Here, we have 6 elements and array elements are 11 15 26 38 9 10, Sorted array in ascending order will be 9 10 11 15 26 38.

### Question 5

Dinesh is fond of video games. Due to the pandemic, he designs a video game called Corona world. In this game, the player enters the game with a certain energy. The player should defeat all the corona infected zombies to reach the next level. When time increases the zombies will increase double the previous minute. Anyhow the player can manage to fight against all the zombies. In this case, definitely the player can not achieve the promotion. Hence the player gets a superpower to destroy all the zombies in the current level when the current game time is a palindrome. Anyhow the player can manage only if he knows the time taken to get the superpower. Help the player by providing the minimum minutes needed to get the superpower by which he can destroy all the zombies. You will be provided with the starting time of the game.

Input

Format:

First-line contains a string representing the starting time.

Output:

A string representing the minimum minutes needed to get the superpower.

Constraints:

Input time will be in 24 hours format

Sample

Input:

05:39

Sample

Output:

11

Explanation:

It takes 11 minutes for minute value to become 50, 05:50 is a palindromic time.

Sample

Input

:

Input

04:45

Sample

Output:

65

Question 6

Given an integer matrix of size  $N \times N$ . Traverse it in a spiral form.

Format:

Input:

The first line contains  $N$ , which represents the number of rows and columns of a matrix. The next  $N$  lines contain  $N$  values, each representing the values of the matrix.

Output:

A single line containing integers with space, representing the desired traversal.

- Constraints:  $0 < N < 500$

Example 1:

Input:

3

1 2 3

4 5 6

7 8 9

Output:

1 2 3 6 9 8 7 4 5

Example 2:

Input

3

1 2 3

4 5 6

7 8 9

Output:

1 2 3 6 9 8 7 4 5

Question 7

You are playing an online game. In the game, a list of  $N$  numbers is given. The player has to arrange the numbers so that all the odd numbers of the list come after the even numbers. Write an algorithm to arrange the given list such that all the odd numbers of the list come after the even numbers.

Input

The first line of the input consists of an integer num, representing the size of the list( $N$ ). The second line of the input consists of  $N$  space-separated integers representing the values of the list

Output

Print N space-separated integers such that all the odd numbers of the list come after the even numbers

Example

Sample Input

8

10 98 3 33 12 22 21 11

Sample Output

10 98 12 22 3 33 21 11

Explanation

All the even numbers are placed before all the odd numbers.

Solution

Input

8

15 16 14 17 18 19 20 11

Question 8

A digital machine generates binary data which consists of a string of 0s and 1s. A maximum signal M, in the data, consists of the maximum number of either 1s or 0s appearing consecutively in the data but M can't be at the beginning or end of the string. Design a way to find the length of the maximum signal.

Input

The first line of the input consists of an integer N, representing the length of the binary string. The second line consists of a string of length N consisting of 0s and 1s only.

Output

Print an integer representing the length of the maximum signal.

Example

Example 1:

Input

6

101000

Output

1

Explanation

For 101000, M can be 0 at the second index or at the third index so in both cases max length = 1.

Example2:

Input

9

101111110

Output

6

Explanation

For 101111110, M = 111111 so maxlength = 6.



### Question 9

The function accepts two positive integers 'r' and 'unit' and a positive integer array 'arr' of size 'n' as its argument 'r' represents the number of rats present in an area, 'unit' is the amount of food each rat consumes and each ith element of array 'arr' represents the amount of food present in 'i+1' house number, where  $0 \leq i$

Note:

Return -1 if the array is null

Return 0 if the total amount of food from all houses is not sufficient for all the rats.

Computed values lie within the integer range.

Example:

Input:

r: 7

unit: 2

n: 8

arr: 2 8 3 5 7 4 1 2

Output:

4

Explanation:

Total amount of food required for all rats =  $r * \text{unit}$

$7 * 2 = 14$ .

The amount of food in 1st houses =  $2+8+3+5 = 18$ . Since, amount of food in 1st 4 houses is sufficient for all the rats. Thus, output is 4.

### Question 10

Return the sum of digits of n after converting n from base 10 to base k, given an integer n (in base 10) and a base k.

Each digit should be treated as a base 10 number after conversion, and the result should be provided in base 10.

### Question 11

An automated cutting machine is used to cut rods into segments. The cutting machine can only hold a rod of minLength or more. A rod is marked with the necessary cuts and their lengths are given as an array in the order they are marked. Determine if it is possible to plan the cuts so the last cut is from a rod at least minLength units long.

Example

$n = 3$

lengths = [4, 3, 2]

minLength = 7

The rod is initially  $\text{sum}(\text{lengths}) = 4 + 3 + 2 = 9$  units long. First cut off the segment of length  $4 + 3 = 7$  leaving a rod  $9 - 7 = 2$ . Then check that the length 7 rod can be cut into segments of lengths 4 and 3. Since 7 is greater than or equal to minLength = 7, the final cut can be made. Return "Possible".

Example

$n = 3$

lengths = [4, 2, 3]

minLength = 7

The rod is initially  $\text{sum}(\text{lengths}) = 4 + 2 + 3 = 9$  units long. In this case, the initial cut can be of length 4 or  $4 + 2 = 6$ . Regardless of the length of the first cut, the remaining piece will be shorter than minLength. Because  $n - 1 = 2$  cuts cannot be made, the answer is "Impossible."

### Question 12

Jack is always excited about sunday. It is favourite day, when he gets to play all day. And goes to cycling with his friends.

So every time when the months starts he counts the number of sundays he will get to enjoy. Considering the month can start with any day, be it Sunday, Monday.... Or so on.

Count the number of Sunday jack will get within n number of days.

**Example 1:**

**Input**

mon-> input String denoting the start of the month.

13 -> input integer denoting the number of days from the start of the month.

**Output :**

2 -> number of days within 13 days.

**Explanation:**

The month start with mon(Monday). So the upcoming sunday will arrive in next 6 days. And then next Sunday in next 7 days and so on.

Now total number of days are 13. It means 6 days to first sunday and then remaining 7 days will end up in another sunday. Total 2 sundays may fall within 13 days.

### **Question 13**

Airport security officials have confiscated several item of the passengers at the security check point. All the items have been dumped into a huge box (array). Each item possesses a certain amount of risk[0,1,2]. Here, the risk severity of the items represent an array[] of N number of integer values. The task here is to sort the items based on their levels of risk in the array. The risk values range from 0 to 2.

**Example :**

**Input :**

7 -> Value of N

[1,0,2,0,1,0,2]-> Element of arr[0] to arr[N-1], while input each element is separated by new line.

**Output :**

0 0 0 1 1 2 2 -> Element after sorting based on risk severity

**Example 2:**

input : 10 -> Value of N

[2,1,0,2,1,0,0,1,2,0] -> Element of arr[0] to arr[N-1], while input each element is separated by a new line.

**Output :**

0 0 0 0 1 1 1 2 2 2 ->Elements after sorting based on risk severity.

**Explanation:**

In the above example, the input is an array of size N consisting of only 0's, 1's and 2s. The output is a sorted array from 0 to 2 based on risk severity.

**Question 14**

Given an integer array Arr of size N the task is to find the count of elements whose value is greater than all of its prior elements.

Note : 1st element of the array should be considered in the count of the result.

For example,

Arr[]={7,4,8,2,9}

As 7 is the first element, it will consider in the result.

8 and 9 are also the elements that are greater than all of its previous elements.

Since total of 3 elements is present in the array that meets the condition.

Hence the output = 3.

**Example 1:**

**Input**

5 -> Value of N, represents size of Arr

7-> Value of Arr[0]

4 -> Value of Arr[1]

8-> Value of Arr[2]

2-> Value of Arr[3]

9-> Value of Arr[4]

**Output :**

3

**Example 2:**

5 -> Value of N, represents size of Arr

3 -> Value of Arr[0]

4 -> Value of Arr[1]

5 -> Value of Arr[2]

8 -> Value of Arr[3]

9 -> Value of Arr[4]

**Output :**

5

**Constraints**

$1 \leq N \leq 20$

$1 \leq \text{Arr}[i] \leq 10000$

### Question 15

A supermarket maintains a pricing format for all its products. A value N is printed on each product. When the scanner reads the value N on the item, the product of all the digits in the value N is the price of the item. The task here is to design the software such that given the code of any item N the product (multiplication) of all the digits of value should be computed(price).

#### Example 1:

##### Input :

5244 -> Value of N

##### Output:

160 -> Price

##### Explanation:

From the input above

Product of the digits 5,2,4,4

$$5 * 2 * 4 * 4 = 160$$

Hence, output is 160.

### Question 16

A furnishing company is manufacturing a new collection of curtains. The curtains are of two colors aqua(a) and black (b). The curtains color is represented as a string(str) consisting of a's and b's of length N. Then, they are packed (substring) into L number of curtains in each box. The box with the maximum number of 'aqua' (a) color curtains is labeled. The task here is to find the number of 'aqua' color curtains in the labeled box.

**Note :**

If 'L' is not a multiple of N, the remaining number of curtains should be considered as a substring too. In simple words, after dividing the curtains in sets of 'L', any curtains left will be another set(refer example 1)

**Example 1:****Input :**

bbbaaababa -> Value of str

3 -> Value of L

**Output:**

3 -> Maximum number of a's

**Explanation:**

From the input given above.

Dividing the string into sets of 3 characters each

Set 1: {b,b,b}

Set 2: {a,a,a}

Set 3: {b,a,b}

Set 4: {a} -> leftover characters also as taken as another set

Among all the sets, Set 2 has more number of a's. The number of a's in set 2 is 3.

Hence, the output is 3.

**Example 2:****Input :**

abbbaabbb -> Value of str

5 -> Value of L

**Output:**

2 -> Maximum number of a's

**Explanation:**

From the input given above,

Dividing the string into sets of 5 characters each.

Set 1: {a,b,b,b,b}

Set 2: {a,a,b,b,b}

Among both the sets, set 2 has more number of a's. The number of a's in set 2 is 2.

Hence, the output is 2.

**Constraints:**

$1 \leq L \leq 10$

$1 \leq N \leq 50$

The input format for testing

The candidate has to write the code to accept two inputs separated by a new line.

First input- Accept string that contains character a and b only

Second input- Accept value for N(Positive integer number)

The output format for testing



The output should be a positive integer number of print the message(if any) given in the problem statement.(Check the output in Example 1, Example 2).

### **Question 17**

An international round table conference will be held in india. Presidents from all over the world representing their respective countries will be attending the conference. The task is to find the possible number of ways(P) to make the N members sit around the circular table such that.

The president and prime minister of India will always sit next to each other.

#### **Example 1:**

##### **Input :**

4 -> Value of N(No. of members)

##### **Output :**

12 -> Possible ways of seating the members

##### **Explanation:**

2 members should always be next to each other.

So, 2 members can be in 2!ways

Rest of the members can be arranged in (4-1)! ways.(1 is subtracted because the previously selected two members will be considered as single members now).

So total possible ways 4 members can be seated around the circular table  $2 \times 6 = 12$ .

Hence, output is 12.

#### **Example 2:**

##### **Input:**

10 -> Value of N(No. of members)

**Output :**

725760 -> Possible ways of seating the members

**Explanation:**

2 members should always be next to each other.

So, 2 members can be in  $2!$  ways

Rest of the members can be arranged in  $(10-1)!$  Ways. (1 is subtracted because the previously selected two members will be considered as a single member now).

So, total possible ways 10 members can be seated around a round table is

$2 \times 362880 = 725760$  ways.

Hence, output is 725760.

The input format for testing

The candidate has to write the code to accept one input

First input – Accept value of number of N(Positive integer number)

The output format for testing

The output should be a positive integer number or print the message(if any) given in the problem statement(Check the output in example 1, example2)

**Constraints :**

$2 \leq N \leq 50$

## Question 18

An intelligence agency has received reports about some threats. The reports consist of numbers in a mysterious method. There is a number “N” and another number “R”. Those numbers are studied thoroughly and it is concluded that all digits of the number ‘N’ are summed up and this action is performed ‘R’ number of times. The resultant is also a single digit that is yet to be deciphered. The task here is to find the single-digit sum of the given number ‘N’ by repeating the action ‘R’ number of times.

If the value of ‘R’ is 0, print the output as ‘0’.

### Example 1:

#### Input :

99 -> Value of N

3 -> Value of R

#### Output :

9 -> Possible ways to fill the cistern.

#### Explanation:

Here, the number N=99

1. Sum of the digits N:  $9+9 = 18$
2. Repeat step 2 ‘R’ times i.e. 3 times  $(9+9)+(9+9)+(9+9) = 18+18+18 = 54$
3. Add digits of 54 as we need a single digit  $5+4$

Hence , the output is 9.

### Example 2:

#### Input :

1234 -> Value of N

2 -> Value of R

**Output :**

2 -> Possible ways to fill the cistern

**Explanation:**

Here, the number  $N=1234$

1. Sum of the digits of N:  $1+2+3+4=10$
2. Repeat step 2 'R' times i.e. 2 times  $(1+2+3+4)+(1+2+3+4)=10+10=20$
3. Add digits of 20 as we need a single digit.  $2+0=2$

Hence, the output is 2.

**Constraints:**

$0 < N \leq 1000$

$0 \leq R \leq 50$

The Input format for testing

The candidate has to write the code to accept 2 input(s)

First input- Accept value for N (positive integer number)

Second input: Accept value for R(Positive integer number)

The output format for testing

The output should be a positive integer number or print the message (if any) given in the problem statement. (Check the output in Example 1, Example 2).

## Question 19

Particulate matters are the biggest contributors to Delhi pollution. The main reason behind the increase in the concentration of PMs include vehicle emission by applying Odd Even concept for all types of vehicles. The vehicles with the odd last digit in the registration number will be allowed on roads on odd dates and those with even last digit will on even dates.

Given an integer array  $a[]$ , contains the last digit of the registration number of  $N$  vehicles traveling on date  $D$  (a positive integer). The task is to calculate the total fine collected by the traffic police department from the vehicles violating the rules.

**Note :** For violating the rule, vehicles would be fined as  $X$  Rs.

### Example 1:

#### Input :

4 -> Value of  $N$

{5,2,3,7} ->  $a[]$ , Elements  $a[0]$  to  $a[N-1]$ , during input each element is separated by a new line

12 -> Value of  $D$ , i.e. date

200 -> Value of  $x$  i.e. fine

#### Output :

600 -> total fine collected

#### Explanation:

Date  $D=12$  means , only an even number of vehicles are allowed.

Fine will be collected from 5,3 and 7 with an amount of 200 each.

Hence, the output = 600.

### Example 2:

**Input :**

5 -> Value of N

{2,5,1,6,8} -> a[], elements a[0] to a[N-1], during input each element is separated by new line

3 -> Value of D i.e. date

300 -> Value of X i.e. fine

**Output :**

900 -> total fine collected

**Explanation:**

Date D=3 means only odd number vehicles with are allowed.

Fine will be collected from 2,6 and 8 with an amount of 300 each.

Hence, the output = 900

**Constraints:**

- $0 < N \leq 100$
- $1 \leq a[i] \leq 9$
- $1 \leq D \leq 30$
- $100 \leq X \leq 5000$

The input format for testing

The candidate has to write the code to accept 4 input(s).

First input – Accept for N(Positive integer) values (a[]), where each value is separated by a new line.

Third input – Accept value for D(Positive integer)

Fourth input – Accept value for X(Positive integer )

The output format for testing

The output should be a positive integer number (Check the output in Example 1, Example e) if no fine is collected then print "0".

## Question 20

There are two major scales for measuring temperature, celsius & Fahrenheit. Given a floating point input for temperature in celsius scale, Write a program to convert celsius to fahrenheit, up till 2 decimal points.

### Input

56

### Output

132.8

### Explanation:

56 degrees celsius means 132.8 degrees of Fahrenheit to be exact.

## Question 21

You're given an array of integers, print the number of times each integer has occurred in the array.

### Example :

#### Input:

10

1 2 3 3 4 1 4 5 1 2

#### Output:

1 occurs 3 times

2 occurs 2 times  
3 occurs 2 times  
4 occurs 2 times  
5 occurs 1 times

## Question 22

You will be given a left limit and a right limit. You need to Calculate the sum of all prime numbers between a given range x and y, both inclusive.

**Sample Test Case :**

**Input :**     **Output :**

30            68  
40

**Explanation :**

31 and 37 are the two prime numbers in the window.

## Question 23

You're given a string, the characters in the string may get repeated in the string. You're supposed to find the positions of the string elements that are not repeating in print them.

Note: case doesn't matter (case insensitive)

**Input :**                      **Output :**

hghigiklblbmono            7 12 14

**Explanation :**

K, m and n do not repeat.

## Question 24

Given two strings s and t, find the number of distinct subsequences of s which equals t. A subsequence of a string is a new string which is formed from the original string by deleting some (can be none) of the characters without disturbing the relative positions of the remaining characters.