

Q1.

Advanced Coding

Q1. Problem statement:

Given two non-negative integers  $n1$  and  $n2$ , where  $n1 < n2$ . The task is to find the total number of integers

in the range interval  $[n1, n2]$  [both inclusive] which have no repeated digits.

For e.g.

Suppose  $n1 = 11$  and  $n2 = 15$ .

There is the number 11, which has repeated digits, but 12, 13, 14, and 15 have no repeated digits. So, the

output is 4.

Q2. Problem statement:

Given an array  $Arr[]$  of  $N$  integers and a positive integer  $K$ . The task is to cyclically rotate the array clockwise by  $K$ .

Note: Keep the first position of the array unaltered

Example	Input	Output	Explanation
Example 1	<p>5 -- Value of <math>N</math></p> <p>{10, 20, 30, 40, 50} -- Elements of <math>Arr[]</math></p> <p>2 -- Value of <math>K</math></p>	40 50 10 20 30	<p><math>Arr[] = \{10, 20, 30, 40, 50\}</math> and <math>K = 2</math> (Two cyclical rotations)</p> <p>After 1st rotation = {10, 50, 20, 30, 40}</p> <p>After 2nd rotation = {10, 40, 50, 20, 30}</p>
Example 2	<p>4 -- Value of <math>N</math></p> <p>{10, 20, 30, 40} -- Elements of <math>Arr[]</math></p> <p>1 -- Value of <math>K</math></p>	40 10 20 30	<p><math>Arr[] = \{10, 20, 30, 40\}</math> and <math>K=1</math> (One cyclical rotation)</p> <p>After 1st rotation = {10, 40, 20, 30}</p>

Constraints

- $1 < N \leq 100$
- $-100 \leq Arr[i] \leq 100$
- $1 \leq K \leq 100$  Input format for testing
- The candidate should write the code to accept the inputs separated by a new line.

- First Input: Accept a single positive integer value for N representing the size of Arr[]
- Second Input: Accept N number of integer values separated by a new line, as elements of Arr[]
- Third input: Accept a single positive integer value for K representing the number of rotations. Output format for testing
- The output must be N integer numbers separated by a single space character.
- Additional messages in the output will result in the failure of test cases. Instructions
- The system does not allow any kind of hard-coded input value/ values.
- The written program code by the candidate will be verified against the input which are supplied from the system.

03. Given an array Arr[] of N integer numbers. The task is to rewrite the array by putting all multiples of 10 at the end of the given array.

Note: The order of the numbers which are not multiples of 10 should remain unaltered, and similarly, the order of all multiples of 10 should be unaltered.

For e.g. Suppose N = 9 and Arr[]={10, 12, 5, 40, 30, 7, 50, 9, 10}

You have to push all multiple of 10 at the end of the Arr[]

Hence, the output is 12 5 7 9 10 40 30 50 10.

Constraints:

$1 < N \leq 100$  .

$100 \leq \text{Arr}[i] \leq 100$

Input Format for Testing:

1. First input line: Accept a single positive integer value for N representing the size of Arr[].
2. Second Input line: Accept N number of integer values separated by a new line.

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Output Format for Testing:

1. The output must be N integer numbers separated by a single space character (See the output format in examples).
2. Additional messages in the output will result in the failure of test cases.

Q4.

Q2. Given an array Arr[N] of N integers and a positive integer K. The task is to divide the array into two sub-arrays from right after the Kth position and slide the left sub-array of K elements to the end.

Input	Output	Explanation
5 -- Value of N {10, 20, 30, 40, 50} -- Elements of Arr [] 2 -- Value of K	30 40 50 10 20	Arr[] = {10,20,30,40,50} and K=2 (2nd position) Divide array from after 2nd position and add left sub-array {10,20} to the end. So the output is 30 40 50 10 20
4 -- Value of N {10, 20, 30, 40} -- Elements of Arr [] 1 -- Value of K	20 30 40 10	Arr[] = {10, 20, 30, 40} and K=1 (1st position) Divide array from after 1st position and add left sub-array {10} to the end. So the output is 20 30 40 10
4 -- Value of N {10, 20, 30, 40} -- Elements of Arr [] 3 -- Value of K	40 10 20 30	Arr[] = {10, 20, 30, 40} and K=3 (3rd position) Divide array from after 3rd position and add left sub-array {10, 20, 30} to the end. So the output is 40 10 20 30

Constraints

- $1 < N \leq 100$
- $-100 \leq \text{Arr}[i] \leq 100$
- $1 \leq K < N$

## Q5. Advanced Coding

Q1. For hiring a car, a travel agency charges R1 rupees per hour for the first N hours and then R2 rupees per hour. Given the total time of travel in minutes is X. The task is to find the total traveling cost in rupees.

Note: While converting minutes into hours, ceiling value should be considered as the total number of hours.

For example: If the total travelling time is 90 minutes,

i.e. 1.5 hours, it must be considered as 2 hours.

Input	Output	EXplanation
20 ---Value of R1 4 --- Value of N in hours 40 --- Value of R2 300 --- Value of X in minutes	120	Total travelling hours = $300/60 = 5$ hours Rupees 20/hours for first 4 hours $= 20 * 4 = 80$ rupees Rupees 40/hours in 5th hour = $40 * 1 = 40$ rupees Hence, the total travelling cost = $80 + 40 = 120$ rupees
30 --- Value of R1 5 --- Value of N in hours. 35 --- Value of R2 500 -- Value of X in minutes	290	Total travelling hours = $500/60 = 8.33$ , Ceiling value of 8.33 = 9 hours Rupees 30/hours for first 5th hours = $30 * 5 = 150$ rupees Rupees 35/hours in 5th hour = $35 * 4 = 140$ rupees Hence, the total travelling cost = $150 + 140 = 290$ rupees
30--- Value of R1 10--- Value of N in hours 35 ---- Value of R2 5 --- Value of X in minutes	30	Total travelling hours = $3/60 = 0.05$ , Ceiling value of 0.05 = 1 hour Rupees 30/hour for first 10 hours $= 30 * 1 = 30$ rupees

Constraints:

$1 < R1 < R2 < 100$

11

$1 \leq N \leq 10$

$1 \leq X < 10000$

Q6. There is a bag with three types of gemstones: Ruby of type R, Garnet of type g, and Topaz of type T. Write a program to find the total number of possible arrangements to make a series of gemstones where no two gemstones of the same type are adjacent to each other.

Input	Output	Explanation
1-Count of R i.e. Ruby 1-Count of G i.e. Garnet 0-Count of T i.e.	2	Arrangements are RG and GR.
1-Count of R i.e. Ruby 1-Count of G i.e. Garnet 1-Count of T i.e. Topaz	6	Arrangements are RGTR, GRTR, RGRT, RTGR, RTRG AND TRGR

Q7.

Given an array Arr[ ] of N integers and a positive integer K. The task is to cyclically rotate the array clockwise by K.

Note : Keep the first of the array unaltered.

Example 1:

5 ---Value of N

{10, 20, 30, 40, 50} ---Element of Arr[]

2----- Value of K

Output :

40 50 10 20 30

Example 2:

4---- Value of N

{10, 20, 30, 40}---- Element of Arr[]

1----- Value of K

Output :

40 10 20 30

08.

Question 2

Given two non-negative integers  $n1$  and  $n2$ , where  $n1 < n2$ . The task is to find the total number of integers in the range  $[n1, n2]$  (both inclusive) which have no repeated digits.

For example:

Suppose  $n1=11$  and  $n2=15$ .

There is the number 11, which has repeated digits, but 12, 13, 14 and 15 have no repeated digits. So, the output is 4.

Example1:

Inout:

11 --- Vlaue of  $n1$

15 -- value of  $n2$

Output:

4

Example 2:

Input:

101 -- value of  $n1$

200 -- value of  $n2$

Output:

72

09.

**Question 1:**

For hiring a car, a travel agency charges R1 rupees per hour for the first N hours and then R2 rupees per hour. Given the total time of travel in minutes in X.

The task is to find the total travelling cost in rupees.

Note : While converting minutes into hours, ceiling value should be considered as the total number of hours.

For example : If the total travelling time is 90 minutes, i.e. 1.5 hours, it must be considered as 2 hours.

Example :

Input :

20 -- r1

4 -- n

40 -- r2

300 -- x

Output :

120

Explanation :

Total travelling hours =  $300 / 60 = 5$  hours

Rupees 20 / hours for first 4 hours =  $20 * 4 = 80$  rupees

Rupees 40 / hours in 5th hour =  $40 * 1 = 40$  rupees

Hence, the total travelling cost =  $80 + 40 = 120$  rupees

10.

**Question 2:**

Explanation:

There is a bag with three types of gemstones: Ruby of type R, Garnet of G, and Topaz of type T.

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Write a program to find the total number of possible arrangements to make a series of gemstones where no two gemstones of the same type are adjacent to each other.

Example 1:

Input:

1-- count of Ruby

1-- count of Garnet

0-- count of Topaz

Output:

2

Arrangements are RG and GR.

Example 1:

Input:

1-- count of Ruby

1-- count of Garnet

1-- count of Topaz

Output:

6



11.

**Q) Write a program that receives a word A and some texts as input. You need to output the texts (without modifying them) in the ascending order of the number of occurrences of the word A in the texts. The input is as follows: an integer M(between 1 and 100, inclusive), followed by the word A in the next line, and some text in each of the M next lines.**

**Example 1**

- Input: 2  
Java  
I hate java  
Python is a good programming language
- Output: Python is a good programming language  
I hate java

**Example 2**

- Input: 3  
python  
I like to code in python  
python is named after a show name monty python and not after the snake python  
I think python is good i think python is important than php
- Output: i like to code in python  
i think python is good i think python is important than php  
python is named after a show name monty python and not after the snake python

12.

**Q) Write a program that will print the sum of diagonal elements of a 10X10 matrix. The program will take a total of 100 numbers as input (10 numbers will be input per line and each number will be separated by a space).**

**Example 1**

- Input: 1 2 3 4 5 6 7 8 9 0  
0 1 2 3 4 5 6 7 8 0  
3 4 5 6 7 8 9 6 4 0  
2 3 4 5 6 7 8 9 3 2  
3 4 5 6 7 4 3 2 1 3  
3 4 5 6 2 4 4 2 4 6  
2 3 4 6 2 4 6 2 3 5  
2 3 5 6 2 4 6 2 3 5  
2 4 6 2 1 4 3 3 5 2  
3 3 5 2 4 6 2 1 4 6
- Output: 42

**Example 2**

- Input: 1 22 33 44 55 66 77 88 99 100  
100 1 88 77 66 55 44 33 22 11  
88 88 1 66 55 44 33 22 11 100  
88 77 66 1 44 33 22 11 100 99  
77 66 55 44 1 22 11 88 99 100  
66 55 44 33 22 1 77 88 99 100  
44 33 22 11 100 99 1 77 66 55  
33 22 11 100 99 88 77 1 55 44  
22 11 100 99 88 77 66 55 1 33  
100 11 22 33 44 55 99 88 77 1
- Output: 10

13.

**Q) Write a program that will take one string as input. The program will then remove vowels a, e, i, o, and u (in lower or upper case ) from the string. If there are two or more vowels that occur together then the program shall ignore all of those vowels.**

**Example 1**

- Input: Cat
- Output: Ct

**Example 2**

- Input: Computer
- Output: Cmpuutr

14.

**Q) Write a program to find out and display prime numbers from the given list of integers. The program will accept input in two lines. First-line contains a number indicating the total number of integers in the list and the second line contains integers separated by spaces.**

**Example 1**

- Input: 5  
4 6 9 3 7
- Output: 3 7

**Example 2**

- Input: 10  
8 10 3 12 7 15 11 2 17 26
- Output: 3 7 11 2 17

15.

**Questions:** Andy wants to go on a vacation to de-stress himself. Therefore he decides to take a trip to an island. It is given that he has as many consecutive days as possible to rest, but he can only make one trip to the island. Suppose that the days are numbered from 1 to N. Andy has M obligations in his schedule, which he has already undertaken and which correspond to some specific days. This means that ith obligation is scheduled for day Di. Andy is willing to cancel at most k of his obligations in order to take more holidays.

Your task is to find out the maximum days of vacation Andy can take by canceling at most K of his obligations.

### Input Format

- The first line contains an integer  $N$ , denoting the total number of days
- The next line contains an integer  $M$  denoting the total number of obligations.
- The next line contains an integer  $K$  denoting the largest number of obligations he could cancel
- Each line  $i$  of the  $M$  subsequent lines (where  $0 \leq i \leq M$ ) contains an integer describing  $D_i$ .

### Constraints

- $1 \leq N \leq 10^6$
- $1 \leq M \leq 2 \cdot 10^6$
- $1 \leq K \leq 2 \cdot 10^6$
- $1 \leq D[i] \leq 10^6$

### Sample Input 1:

10  
5  
2  
6  
9  
3  
2  
7

### Sample Output 1 :

5

16.

**Q) Khaled has an array A of N elements. It is guaranteed that N is even. He wants to choose at most N/2 elements from array A. It is not necessary to choose consecutive elements. Khaled is interested in XOR of all the elements he chooses. Here, XOR denotes the bitwise XOR operation.**

**For example:**

- If  $A=[2,4,6,8]$ , then khaled can choose the subset  $[2,4,8]$  to achieve  $XOR=(2 \text{ XOR } 4 \text{ XOR } 8)=14$ .

Khaled wants to maximize the XOR of all the elements he chooses. Your task is to help khaled to find the max XOR of a subset that he can achieve by choosing at most N/2 elements?

**Input format:**

- The first line contains an integer, N, denoting the number of elements in A.
- Each line i of the N subsequent lines (where  $0 \leq i \leq N$ ) contains an integer describing  $A_i$ .

**Constraints**

- $1 \leq N \leq 120$
- $1 \leq A[i] \leq 10^6$

**Sample Input 1**

2

1

2

**Sample Output 1**

2

17.

**Q) Write a program to calculate and return the sum of absolute difference between the adjacent number in an array of positive integers from the position entered by the user.**

You are expected to write code in the **findTotalSum** function only which receive three positional arguments:

1st: number of elements in the array

2nd: Array

3rd: position from where the sum is to be calculated

#### **Example**

##### **Input**

input 1 : 7

input 2 : 11 22 12 24 13 26 14

input 3 : 5

##### **Output**

25

##### **Explanation**

The first parameter 7 is the size of the array. Next is an array of integers and input 5 is the position from where you have to calculate the Total Sum. The output is 25 as per calculation below.

$$| 26-13 | = 13$$

$$| 14-26 | = 12$$

$$\text{Total Sum} = 13 + 12 = 25$$

18.

**Q) Write a program to find the difference between the elements at odd index and even index.**

**Note :** You are expected to write code in the **findDifference** function only which receive the first parameter as the numbers of items in the array and second parameter as the array itself. You are not required to take the input from the console.

#### **Example**

Finding the maximum difference between adjacent items of a list of 5 numbers

#### **Input**

input 1 : 7

input 2 : 10 20 30 40 50 60 70

#### **Output**

40

#### **Explanation**

The first parameter 7 is the size of the array. Sum of element at even index of array is  $10 + 30 + 50 + 70 = 160$  and sum of elements at odd index of array is  $20 + 40 + 60 = 120$ . The difference between both is 40