

Competitive Coding Questions

Question 1:

Year :2020

Juan Marquinhos is a geologist and he needs to count rock samples to send them to a chemical laboratory. He has a problem: The laboratory only accepts rock samples in a range of its size in ppm (parts per million).

Juan Marquinhos receives the rock samples one by one and he classifies the rock samples according to the range of the laboratory. This process is very hard because the number of rock samples may be in the millions.

Juan Marquinhos needs your help, your task is to develop a program to get the number of rocks in each of the ranges accepted by the laboratory.

Input Format

A positive integer S (the number of rock samples) separated by a blank space, and a positive integer R (the number of ranges of the laboratory); A list of the sizes of S samples (in ppm), as positive integers separated by space R lines where the i th line containing two positive integers, space separated, indicating the minimum size and maximum size respectively of the i th range.

Output Format

R lines where the i th line contains a single non-negative integer indicating the number of the samples which lie in the i th range.

Constraints

$$10 < S < 10000$$

$$1 < R < 1000000$$

$$1 \text{ size of each sample (in ppm)} < 1000$$

Example 1

Input: 10 2

345 604 321 433 704 470 808 718 517 811

300 350

400 700

Output: 2 4

Explanation:

There are 10 samples (S) and 2 ranges (R). The samples are 345 604 321 433 704 470 808 718 517 811. The ranges are 300-350 and 400-700. There are 2 samples in the first range (345 and 321) and 4 samples in the second range (604, 433, 470, 517). Hence the two lines of the output are 2 and 4

Example 2

Input: 20 3

921 107 270 631 926 543 589 520 595 93 873 424 759 537 458 614 725
842 575 195

1 100

50 600

1 1000

Output: 1 12 20

Explanation:

There are 20 samples and 3 ranges. The samples are 921, and 107 195. The ranges are 1-100, 50-600, and 1-1000. Note that the ranges are overlapping. The number of samples in each of the three ranges is 1, 12, and 20 respectively. Hence the three lines of the output are 1, 12, and 20.

Question 2:

Year :2020

There are two banks – Bank A and Bank B. Their interest rates vary. You have received offers from both banks in terms of the annual rate of interest, tenure, and variations of the rate of interest over the entire tenure. You have to choose the offer which costs you the least interest and reject the other. Do the computation and make a wise choice.

The loan repayment happens at a monthly frequency and Equated Monthly Installment (EMI) is calculated using the formula given below :

$$\text{EMI} = \text{loan amount} * \text{monthly interest rate} / (1 - 1 / (1 + \text{monthly interest rate})^{(\text{number of years} * 12)})$$

Constraints:

$$1 \leq P \leq 1000000$$

$$1 \leq T \leq 50$$

$$1 \leq N1 \leq 30$$

$$1 \leq N2 \leq 30$$

Input Format:

First line: P principal (Loan Amount)

Second line: T Total Tenure (in years).

Third Line: N1 is the number of slabs of interest rates for a given period by Bank A. The first slab starts from the first year and the second slab starts from the end of the first slab and so on.

Next N1 line will contain the interest rate and their period.

After N1 lines we will receive N2 viz. the number of slabs offered by the second bank.

Next N2 lines are the number of slabs of interest rates for a given period by Bank B. The first slab starts from the first year and the second slab starts from the end of the first slab and so on.

The period and rate will be delimited by a single white space.

Output Format: Your decision is either Bank A or Bank B.

Example 1

Input

10000

20

3

5 9.5

10 9.6

5 8.5

3

10 6.9

5 8.5

5 7.9

Output: Bank B

Example 2

Input

500000

26

3

13 9.5

3 6.9

10 5.6

3

14 8.5

6 7.4

6 9.6

Output: Bank A

Question 3:

Year :2019

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 4:

Year :2019

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 5:

Year :2019

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 6:

Year :2020[Repeat Type]

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 7:

Year :2019

The selection of MPCSC exams includes a fitness test which is conducted on the ground.

There will be a batch of 3 trainees, appearing for a running test on track for 3 rounds.

You need to record their oxygen level after every round.

After trainees are finished with all rounds, calculate for each trainee his average oxygen level over the 3 rounds and select the one with the highest average oxygen level as the fittest trainee.

If more than one trainee attains the same highest average level, they all need to be selected.

Display the fittest trainee(or trainees) and the highest average oxygen level.

Note:

1. The oxygen value entered should not be accepted if it is not in the range between 1 and 100.
2. If the calculated maximum average oxygen value of the trainees is below 70 then declare the trainees as unfit with a meaningful message as “All trainees are unfit”
3. Average oxygen values should be rounded

Example 1:

Input #1:

95

92

95

92

90

92

90

92

90

Output:

Trainee Number: 1

Trainee Number: 3

Note: Input should be 9 integer values representing oxygen levels entered in order as

Round 1:

Oxygen value of trainee 1

Oxygen value of trainee 2

Oxygen value of trainee 3

Round 2:

Oxygen value of trainee 1

Oxygen value of trainee 2

Oxygen value of trainee 3

Round 3:

Oxygen value of trainee 1

Oxygen value of trainee 2

Oxygen value of trainee 3

Oxygen must be in the given format as in the above example.

For any wrong input, the final output should display “INVALID INPUT”

Input #2:

91

92

45

92

80

90

90

92

The selection of MPCS exams includes a fitness test which is conducted on the ground.

There will be a batch of 3 trainees, appearing for a running test on track for 3 rounds.

You need to record their oxygen level after every round.

After trainees are finished with all rounds, calculate for each trainee his average oxygen level over the 3 rounds and select the one with the highest average oxygen level as the fittest trainee.

If more than one trainee attains the same highest average level, they all need to be selected.

Display the fittest trainee(or trainers) and the highest average oxygen level.

Note:

1. The oxygen value entered should not be accepted if it is not in the range between 1 and 100.
2. If the calculated maximum average oxygen value of the trainees is below 70 then declare the trainees as unfit with a meaningful message as “All trainees are unfit”
3. Average oxygen values should be rounded

Example 1:

Input #1:

95

92

95

92

90

92

90

92

90

Output:

Trainee Number: 1

Trainee Number: 3

Note: Input should be 9 integer values representing oxygen levels entered in order as

Round 1:

Oxygen value of trainee 1

Oxygen value of trainee 2

Oxygen value of trainee 3

Round 2:

Oxygen value of trainee 1

Oxygen value of trainee 2

Oxygen value of trainee 3

Round 3:

Oxygen value of trainee 1

Oxygen value of trainee 2

Oxygen value of trainee 3

Oxygen must be in the given format as in the above example.

For any wrong input, the final output should display “INVALID INPUT”

Input #2:

91

92

45

92

80

90

90

92

90

Question 8:

Year :2019

Our hoary culture had several great

persons since time immemorial
and king Vikramaditya's nava
ratnas (nine gems) belongs to this ilk.

They are named in the following shloka:

Among these, Varahamihira was an astrologer of eminence and
his book Brihat Jataak is recokened
as the ultimate authority in astrology.

He was once talking with Amarasimha, another
gem among the nava ratnas and the author of the
Sanskrit thesaurus, Amarakosha. Amarasimha wanted to
know the final position of a person, who starts from
the origin 0 0 and travels per the following scheme.

..He first turns and travels 10 units of distance

..His second turn is upward for 20 units

..The third turn is to the left for 30 units

..The fourth turn is downward for 40 units

..The fifth turn is to the right(again) for 50 units

..And thus he travels, every time increasing the travel distance by 10 units.

Constraints:

$2 \leq n \leq 1000$

Input:

3

Output :

-20 20

Question 9:**Year :2019**

Given a maximum of four digits to the base

17(10 -> A, 11 -> B, 12 -> C, 16 -> G) as input,

output its decimal value.

Input:

23GF

Output:

10980

Question 10:**Year :2020**

One programming language has the following keywords

that cannot be used as identifiers:

break, case, continue, default, defer, else,

for, func, goto, if, map, range, return, struct, type, var

Write a program to find if the given word is a keyword or not

Input #1:

defer

Output:

defer is a keyword

Input #2:

While

Output:

while is not a keyword

Question 11:

Year :2020

There is a jar full of candies for sale at a mall counter.

The jar has the capacity N , that is JAR can contain maximum N Candies when a JAR is full. At any point in time, JAR can have an M number of candies where $M \leq N$.

Candies are served to the customers. JAR is never remaining empty as when the last K candidates are left, JAR is refilled with new candidates in such a way that JAR gets full.

Write the code to implement the above scenario.

Display JAR at the counter with the available number of candies.

Input should be the number of candies one customer orders at a point in time. Update the JAR after every purchase and display JAR at the counter. The output should give the number of candies sold and the updated number of candies in the JAR. If the input is more than the number of candies in JAR, return "INVALID INPUT".

Given,

$N=10$, Where N is the number of candies available,

$K \leq 5$, Where K is the number of minimum candies that must be inside JAR ever.

Example1: ($N=10, K \leq 5$)

Input #1:

3

Output :

Number of Candies Sold: 3

Number of Candies available:7

Input #2:

4

Output:

NUMBER OF CANDIES SOLD: 4

NUMBER OF CANDIES AVAILABLE: 6

Question 12:

Year :2020

Write a code to print the co-ordinates of a saddle point.

Search for the "saddle points" in

a 2 by 2 array of integers.

A saddle point is a cell whose value

is greater than or equal to any in its row,

and less than or equal to any in its column.

Print out the coordinates of any saddle points your program finds.

Sample Input:

3 1

2 1

Sample Output:

1,0

Question 13:**Year :2019**

A Robot wants to move through a cave grid of size $M \times N$.

(M- Rows N- Columns).It starts from (0,0) and destination is

(M-1,N-1). It can only move right or down .

Calculate the total number of ways robot can reach the destination

Sample Input:

5 5

Sample Output:

70

Question 14:**Year :2019**

Write a java program to print the minimum steps required to reach the end of the given array.

Consider you are at the start of array i.e.)0th index position.

Every index will hold the value of maximum steps you take from that index in one jump(if the value is 0 then person cannot move).

You have to reach the end of the array $n-1$ ($n > 1$).

Print the minimum number of steps required to reach the endpoint. If it's not possible to reach the end print -1.

Input Constraint:

$1 \leq n \leq 1000$

$1 \leq \text{array element} \leq 50$

Input Format:

First line contains the n

Second line contains n numbers separated using space.

Output Format:

Print the minimum number of
steps or -1 if we cannot reach the end

Sample Input:

5

2 4 1 5 1

Sample Output:

2

Explanation

From 0th index jump to 1st index and then jump to the 4th index.

Question 15:

Year :2020

You are distributing N candies to K candies.

You give 1 candy to the first child,

2 candies to the second child ,

3 candies to the third child and so till K children have
received the candies , You

then start from the first child again and give him/her K+1
candies, K+2 candies to the

second child and so on till all the candies are distributed.

Find the number of candies that each child gets.

Input Specification:

Input 1:

The number of candies N.

Input 2:

The number of children K.

Output Specification :

Return array A representing the candies all children get
where $A[i]$ is the number of candies received by i th child.

Exempl 1:

input 1: 7

input 2: 4

Output: 1 2 3 1

Explanation:

Here the first child gets 1 candy , Second child gets 2 candies
Third child gets 3 candies and now you have only 1 candy left,
so you give it to the fourth child.

Example 2:

input 1: 10

input 2:3

Output: 5 2 3

Explanation:

Here the first child gets 1 candy ,second child gets 2 candies ,
third child gets 3 candies and now you go back to the first child and
give him/her $4(K+1=3+1=4)$ candies which are all that you have.

Question 16:

Year :2020

Given a pair of positive integers m and n
($m < n$; $0 < m < 999$; $1 < n \leq 999$),
write a program to smartly affix zeroes,
while printing the numbers from m to n.

Example-1

Input

5 10

Expected output

05 06 07 08 09 10

Example-2

Input

9 100

Expected output

009 010 011 012 013 014 015 016 017 018 019
020 021 022 023 024 025 026 027 028 029 030
031 032 033 034 035 036 037 038 039 040 041
042 043 044 045 046 047 048 049 050 051 052

053 054 055 056 057 058 059 060 061 062 063
064 065 067 068 069 070 071 072 073 074 075
076 077 078 079 080 081 082 083 084 085 086
087 088 089 090 091 092 093 094 095 096 097
098 099 100

Example-3

Input

1 9

Output:

1 2 3 4 5 6 7 8 9

Question 17:

Year :2020

It was one of the places, where people need to get their provisions only through fair price (“ration”) shops.

As the elder had domestic and official work to attend to, their wards were asked to buy the items from these shops.

Needless to say, there was a long queue of boys and girls.

To minimize the tedium of standing in the serpentine queue, the kids were given mints. I went to the last boy in the queue and asked him how many mints he has. He said that the number of mints he has is one less than the sum of all the mints of kids standing before him in the queue.

So I went to the penultimate kid to know how many minutes she has.

She said that if I add all the mints of kids before her and subtract

one from it, the result equals the mints she has. It seemed to be a uniform response from everyone. So, I went to the boy at the head of the queue consoling myself that he would not give the same response as others. He said, “I have four mints”.

Given the number of the first kid’s mints (n) and the length (len) of the queue as input, write a program to display the total number of mints with all the kids.

constraints:

$$2 < n < 10$$

$$1 < len < 20$$

Input#1:

4 2

Output:

7

Input#2:

14 4

Output#2:

105

Question 18:

Year :2021

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)

Additional messages in the output will result in the failure of test case

Question 19:

Year :2021

A washing machine works on the principle of Fuzzy System, the weight of clothes put inside it for washing is uncertain But based on weight measured by sensors, it decides time and water level which can be changed by menus given on the machine control area.

For low level water, the time estimate is 25 minutes, where approximately weight is between 2000 grams or any nonzero positive number below that.

For medium level water, the time estimate is 35 minutes, where approximately weight is between 2001 grams and 4000 grams.

For high level water, the time estimate is 45 minutes, where approximately weight is above 4000 grams.

Assume the capacity of machine is maximum 7000 grams

Where approximately weight is zero, time estimate is 0 minutes.

Write a function which takes a numeric weight in the range

[0,7000] as input and produces estimated time as

output is: “OVERLOADED”, and for all other inputs, the output statement is

“INVALID INPUT”.

Input should be in the form of integer value –

Output must have the following format –

Time Estimated: Minutes

Example:

Input value

2000

Output value

Time Estimated: 25 minutes

Question 20:

Year :2021

We want to estimate the cost of painting a property.

Interior wall painting cost is Rs.18 per sq.ft. and exterior wall painting cost is Rs.12 per sq.ft.

Take input as

1. Number of Interior walls
2. Number of Exterior walls
3. Surface Area of each Interior Wall in units of square feet
4. Surface Area of each Exterior Wall in units of square feet

Surface Area of each Exterior Wall in units of square feet

If a user enters zero as the number of walls then skip Surface area values as User may don't want to paint that wall.

Calculate and display the total cost of painting the property

Example 1:

6

3

12.3

15.2

12.3

15.2

12.3

15.2

10.10

10.10

10.00

Total estimated Cost : 1847.4 INR

Note: Follow in input and output format as given in above example

Question 21:

Year :2021

Checking if a given year is leap year or not

Explanation:

To check whether a year is leap or not

Step 1:

We first divide the year by 4.

If it is not divisible by 4 then it is not a leap year.

If it is divisible by 4 leaving remainder 0

Step 2:

We divide the year by 100

If it is not divisible by 100 then it is a leap year.

If it is divisible by 100 leaving remainder 0

Step 3:

We divide the year by 400

If it is not divisible by 400 then it is a leap year.

If it is divisible by 400 leaving remainder 0

Then it is a leap year

Sample Input:

2023

Sample Output:

2023 is surely not a leap year

Question 22:

Year :2021

Prime Numbers with a Twist

Write a code to check whether no is prime or not.

Condition use function check() to find whether entered no
is positive or negative ,if negative then enter the no,

And if yes pas no as a parameter to prime() and check whether no is prime
or not?

Whether the number is positive or not,

if it is negative then print the message “please enter the positive number”

It is positive then call the function

prime and check whether the take positive number is prime or not.

Sample Input:

7

Sample Output:

Entered number is a prime number

Question 23:

Year :2019

Find the 15th term of the series?

0,0,7,6,14,12,21,18, 28

Explanation :

In this series the odd term is increment of 7 {0, 7, 14, 21, 28, 35 ————
— }

And even term is a increment of 6 {0, 6, 12, 18, 24, 30 ———— }

Sample Input:

15

Sample Output:

Series :

0 0 7 6 14 12 21 18 28 24 35 30 42 36 49

15th element of the series is = 49

Question 24:

Year :2019

Consider the following series: 1, 1, 2, 3, 4, 9, 8, 27, 16, 81, 32, 243, 64, 729, 128, 2187 ...

This series is a mixture of 2 series – all the odd terms in this series form a geometric series and all the even terms form yet another geometric series. Write a program to find the Nth term in the series.

The value N in a positive integer that should be read from STDIN.

The Nth term that is calculated by the program should be written to STDOUT.

Other than value of n th term, no other character / string

or message should be written to STDOUT. For example ,

if N=16, the 16th term in the series is 2187, so only value 2187 should be printed to STDOUT.

You can assume that N will not exceed 30.

Question 25:

Year :2019

Consider the below series :

0, 0, 2, 1, 4, 2, 6, 3, 8, 4, 10, 5, 12, 6, 14, 7, 16, 8

This series is a mixture of 2 series all the odd terms in this series form even numbers in ascending order and every even terms

is derived from the previous term using the formula $(x/2)$

Write a program to find the nth term in this series.

The value n in a positive integer that should be read from STDIN the nth term that is calculated by the program should be written to STDOUT.

Other than the value of the nth term no other characters /strings or message should be written to STDOUT.

For example if $n=10$, the 10th term in the series is to be derived from the 9th term in the series. The 9th term is 8 so the 10th term is $(8/2)=4$. Only the value 4 should be printed to STDOUT.

You can assume that the n will not exceed 20,000.