Python Programming Questions

**If Else Questions:**

1. "You are comparing the heights of two buildings. Building A is h1 meters tall, and Building B is h2 meters tall. Which building is taller?"
   1. Find the greater number among 2 given numbers
2. Three friends, Alice, Bob, and Charlie, want to compare their savings. Given their respective savings stored in variables alice\_savings, bob\_savings, and charlie\_savings, determine who has the most money.
   1. Find the greater number among 3 given numbers
3. A school is organizing a sports event, and students are assigned to two teams based on their roll numbers. If a student's roll number is even, they will join Team A. If it's odd, they will join Team B. Write a program that takes a student's roll number as input and determines which team they belong to.
   1. Write a programe to find a number is even or odd
4. A travel agency is offering special discounts on February bookings. If the year is a leap year (29 days in February), customers get a 20% discount. If it’s not a leap year (28 days in February), they get a 10% discount. Write a program that takes a year as input and displays whether it is a leap year along with the discount offered
   1. Write a programe to find if an year is Leap.

**Number Questions:**

1. A digital locker system requires users to enter a numeric passcode. For security purposes, the system also generates a reversed version of the passcode to use as a backup code. Write a program that takes a number and returns its reverse.
   1. Reverse a Number
2. A ticket booking system wants to assign special discounts to users who enter a palindrome number as their booking reference. A palindrome number is one that remains the same when reversed. Write a program that checks if a number is a palindrome.
3. Emma planted a **magic flower** in her garden. She noticed something special about its petals:
   1. On **Day 1**, it had **1 petal**.
   2. On **Day 2**, it still had **1 petal**.
   3. On **Day 3**, it grew to **2 petals**.
   4. On **Day 4**, it had **3 petals**.
   5. On **Day 5**, it had **5 petals**.
   6. On **Day 6**, it had **8 petals**...
   7. She realized that **each day's petal count** was the **sum of the petals from the two previous days**!
   8. Emma wanted to list **how many petals** her magic flower would have every day for **N days**. Can you help her by writing a Python program?
4. In the above example, Can you predict what will be the number of petals on Nth day.
5. A bank rewards its customers who have an account number that is a 'Perfect Number.' A perfect number is a number whose sum of divisors (excluding itself) equals the number itself. Write a program to check whether a given account number is a perfect number.
6. In the **town of Bellhaven**, there were two giant **church bells** that rang at regular intervals.
   1. The **first bell** rang **every X minutes**.
   2. The **second bell** rang **every Y minutes**.
   3. The townspeople loved hearing the bells ring **together**, but it didn’t happen very often!
   4. One day, the town mayor asked:
   5. "When will both bells ring at the same time again?"
   6. To solve this, we need to find the **Least Common Multiple (LCM)** of the two bell intervals.
   7. Can you write a **Python program** to help the town predict when both bells will ring together?
7. In the town of **Bakeville**, two famous bakers, **Chef Ron** and **Chef Mia**, were preparing for the **Great Bakers' Fair**.
   1. **Chef Ron** had **X cupcakes**. 🧁
   2. **Chef Mia** had **Y cookies**. 🍪
   3. They wanted to **arrange their treats into the largest possible identical groups**, so that each group had **the same number of cupcakes and cookies** without any leftovers.
   4. To solve this, they needed to find the **Greatest Common Divisor (GCD)** of **X and Y**, which is the largest number that evenly divides both.
   5. Can you write a **Python program** to help the chefs organize their treats into equal groups?
8. Wap to print the Fibonacci series based on user input

10) Wap to print the non-Fibonacci numbers by the given input

Sample input: enter a number: 5

Output:4 6 7 9 10

11) Wap to print nth non -Fibonacci number. {input : 10 Output : 16}

12) Lily found an **old wooden ladder** in her grandfather’s attic. It looked normal, but when she tried to climb it, she noticed something strange—the steps weren’t evenly spaced!

The **first step** was **4 cm** high.  
The **second step** was **8 cm** high.  
The **third step** was **7 cm** high.  
The **fourth step** was **11 cm** high.

She realized that:

* Every **odd step (1st, 3rd, 5th, …)** followed a pattern starting from **4** and increased by **3** each time.
* Every **even step (2nd, 4th, 6th, …)** followed a pattern starting from **8** and also increased by **3** each time.

Lily wanted to count **how high the first N steps would be** before she climbed further. Can you help her write a Python program to find out?

**Loops Questions:**

1) A **self-checkout kiosk** at a grocery store needs to display a countdown timer (from 10 to 1) before automatically canceling an inactive session. The system should print numbers from **1 to 10** to show the time remaining before session expiration.

4) A **mobile payment app** wants to implement a simple fraud detection mechanism. One method is to check the **sum of digits** of the transaction ID. If the sum is too small or too large, the transaction is flagged for review.

Your task is to write a program that calculates the **sum of digits** of any given transaction ID. Input:123 output: 6.

5) A company is organizing a large-scale project and assigning teams sequential numbers (1, 2, 3, ... n). However, due to resource constraints, only **even-numbered teams** receive funding.

Each even-numbered team gets a budget equal to **(team number × ₹100)**. The finance department wants to automate the calculation of the total allocated budget for all even-numbered teams up to n.

6) An **e-commerce platform** assigns a **security code** to each high-value transaction. To enhance security, the system ensures that the code is a **Prime Number**, making it harder to predict or break. Write a programme to check if generated code is prime number or not.

7) Once upon a time in the **Kingdom of Numerica**, the royal **treasury vault** held the kingdom’s greatest treasures—gold, jewels, and sacred scrolls of wisdom. The vault was protected by a **magical lock** that could only be opened using a sequence of **Prime Numbers**.

Every year, the kingdom selected a trusted guardian to access the vault. To prove their worth, the guardian had to **recite all Prime Numbers up to a given number**. If they failed, the vault remained locked for another year.

Now, you have been chosen as the next guardian. Can you generate all the **Prime Numbers up to N** to unlock the vault?

8)Wap to print sum of non-primes in a number. {input:3436 output -10}

9) Wap to print the sum of odd digits in a number. { input : 2355 output : 13}

10) Wap to check whether a number is prime or not by using a function.

Additional print a prime numbers up to 20.

11) A **bank** uses a special security system where high-value transactions require a **special authentication PIN**. This PIN must be an **Armstrong Number** to be considered valid. The system ensures that only specific, hard-to-guess PINs are accepted for extra security.

For example, if a customer enters a **4-digit PIN**, the system checks whether the PIN is an **Armstrong Number** before approving the transaction.

12) A tech company assigns **unique badge numbers** to its employees. To ensure security and uniqueness, **only Armstrong Numbers are considered valid badge numbers** within a given range.

The HR department wants a system that can **identify all Armstrong Numbers** in a given range (min\_value to max\_value) so that only these numbers can be used for new employees’ badges.

13) A **customer support system** assigns a **4-digit priority code** to each ticket.

* The **smallest digit** represents **urgency** (lower values indicate higher urgency).
* The **largest digit** represents **complexity** (higher values indicate more difficult issues).

🔹 **System Behavior:**

* If the **minimum digit appears first (left to right)** → Urgent tickets are processed first.
* If the **maximum digit appears first (left to right)** → Complex cases are handled first.

Sample inputs:6381 input : 7198

output: min is first output: max is first

14) A **biometric security system** needs to generate a secure PIN from a user's fingerprint data. Each scanned fingerprint is converted into a unique number, and the system extracts the **smallest prime digit** from this number to enhance security checks. If no prime digits exist, it alerts the user.

Your task is to write a program that finds the **smallest prime digit** (2, 3, 5, or 7) in a given number.

15) A **secure encryption system** needs to generate a prime number **close to a given user ID** to use as a key for encrypting data. Since prime numbers are widely used in cryptography, the system must always find the nearest prime number to a given input to ensure secure communication.

Your task is to write a program that finds the **nearest prime number** to a given input number **N**

Sample inputs: 8 input: 21

output: 7 output: 19,23

Arrays/Lists Questions:

1. A **restaurant billing system** calculates the total bill by summing up the prices of all the ordered items. Each item’s price is stored in a list, and the system must compute the total cost to generate the final bill.

Write a program that takes a list of item prices and calculates the **sum of all elements in the list** (i.e., the total bill amount).

2)Finding the k Element which is present in a List.

3) Wap to print duplicates and unique numbers in an array/List.

4)Find Unique and Duplicate Digits and If only one digit is duplicated,

output: Duplicate is X.

If multiple digits are duplicated, output: Duplicates are X, Y, ....

input :1214

output: 2,4

output: duplicate is 1

5) Count Occurrences of Each Digit

input: 2788

output: 2=> 1

7=> 1

8=> 2

6) Wap to check if each number in an list contains duplicate digits, returning true for duplicates and false for unique digits.

Input: [202,89,112,88] Output:[true ,false ,true ,true]

7)Wap that takes an array of integers as input and calculates the sum of the digits of each number in the list.

Input: [202,89,112,88] Output: [4,17,14,6]

8) Wap to check if the digits of each number in an list are in increasing order, returning true or false for each Increasing order or not

Input: [568,89,112,88,571] Output: [true,true ,false,false ,false]

9) Wap to check if the digits of each number in an list are in decreasing order and return an array of true otherwise false.Decreasing order -true

Input: [538,111,200,652,] Output: [false,false,false,true]

11) Find the missing numbers.

Input: 34571 Outpur : 26 missing

12)Find Largest & Smallest element in an list.

13)Find Second Largest and Third Largest Element in list.

14)Find Second Smallest and Third Smallest in list.

15) Reverse an Array.

16) Given array of N integer, the task is to replace each element of the array by its rank in the array

Input: 20 15 26 2 98 6 Output:4 3 5 1 6 2

Explanation: when the array is sorter 2 rank is 1, 6 rank is 2 , 15 rank is 3

17) Finding the frequency of elements in an array.

arr = [10, 30, 10, 20, 10, 20, 30, 10] O/p: 10=> 4 30 =>2 20=> 2

18) arrange first half in ascending order and second half in descending order

input: 8 7 1 6 5 9 output: 1 5 6 9 8 7

19) check if array is subset of another array or not .if the arr2 contains elements which are there in arr1 then it is a subset of an array.

arr1=[1,3,4,5,2]

arr2=[2,4,3,1,7.5.15]

output: arr1 is subset of arr2

Print arr2 is subset or not subset of arr1

let arr1=[2,21,5,7,3,5,7,3,1,6,14,44];

let arr2=[7,3,1];

20) Wap to print the number of pairs formed by the array of elements

Input: 10 20 10 30 20 20 Output: 2 pairs

Input: 30 50 30 50 20 50 50 20 50 50 Output : 5 pairs

21)find all symmetric pairs in array

inp: (1,2),(2.1),(3,4),(4,5,),(5,4) output: (1,2)(4,5)

Sorting Questions:

1. How sorting method works in Python- ascending order (bubble sorting)
2. Missing even numbers
3. Missing prime number .Input: 11 3 4 5 2 6 7 11 13 Output: 17
4. Wap to print first Fibonacci number. Input: 10 1 0 5 7 Output: 2

2D Arrays/Lists Questions:

1) find the transpose of matrix

inp: Out:

1 1 1 1 2 3

2 2 2 1 2 3

3 3 3 1 2 3

2) read a matrix

input :

2 3 4

3 9 2

3 4 1

find the sum of outer layers

2+3+4+3+3+3+4+1+2= ?

find the sum of diagonal numbers 2+9+1=?

3)read a matrix

input :

2 3 4

3 9 2

3 4 1

find the sum of numbers 2+9+1+4+3=?

4) print the outer number in a matrix

input:

1 2 3

5 4 1

3 6 1

Out:

1 2 3

5 1

3 6 1

Another Question:

input:

8 1 3

4 2 9

3 1 5

output

8 3

2

3 5

5) 1 2 3

4 5 3

2 5 3

Output: print the diagonal elements side by side:

Diagonal elements are :1 5 3 3 5 2

Print the outer layer elements side by side

Outer layer elements: 1 2 3 4 3 2 5 3

Strings Questions:

1) Given an algebric expression , remove brackets

Inp:”a+((b-c)+d)” Out: a+b-c+d

2) Check whether a given string is palindrome or not a palindrome

Inp: mom

Out: “ palindrome”

3) Check vowels count , consonants count and spaces count in a string

4)print non repeated vowels

inp: take u forward is awesome out: aeuoi

in reverse

inp: take u forward is awesome out: eoaio

5) Wap to program to remove vowels from a given string

Inp: “take you forward” Out: tk y frwrd

6) Find the largest word in a string

Inp: “google doc” Out: google

7) Return the longest palindrome in a string

Inp:”abccbc” there are a b c cc bccb cbc Out : bccb

8) Write a program to find a word in a given string that has the highest number of repeated letters , if not found return -1

Input: “google Microsoft” Out: google

Inp: “Cameron blue” Out: -1

9) Find whether it is sub string or not

Print the substring of first index

Inp: “takeuforward”

“forward”

Out:5

10) Input: hello world

Output: d-1

e-1

h-1

o-2

l-3

r-1

w-1

11)Inp: obj={ “ENGLAND”:”LONDON”, “USA” : “WASHINGTON”}

OUT: {“ LONDON”:” ENGLAND”, “WASHINGTON” : “USA”}  
ex:

Inp:{ england: 'london', usa: 'washington' }

Out:{ london: 'england', washington: 'usa' }

Patterns:

1) print

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2)print below pattern

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3) print

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4) reverse primitive

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5) sequence of numbers

1

2 3

4 5 6

7 8 9 10

6)reverse outer primitive

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7) row : 4

Output:

1

3 2

4 5 6

1. 8 7

8)input: chaitanya

Output:

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e m

a n t

h \* \*

9)print

1 5

2 4

3

2 3

1 5

10)Diamond pattern

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11)

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12) 1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

1 2 3 4

1 2 3

1 2

1

13)

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14)

1 2 3 4 5

2 5

3 5

4 5

5

15) Print

1

2 5

3 6 8

4 7 9 10

16) Input:

Rows: 4

Output:

1

21

3 2 1

4 3 2 1

17)Input:

Rows:4

2

4 10

6 12 16

8 14 18 20

18) Alphabets

A

A B

A B C

A B C D

19) Print

A

A B

A B C

A B C D

A B C D E

20) Print

A

B C

D E F

G H I J

K L M N O

21) Print

A

b C

d E f

G h I j

K l M n O

22) Print

0

1 1

2 3 5

8 13 21 34

55 89 144 233 377

23) print

ABCDEFEDCBA

ABCDE EDCBA

ABCD DCBA

ABC CBA

AB BA

A A

24)

1 1

10 10

101 101

1010 1010

101011010

1010 1010

101 101

10 10

1 1

2