

Python Medium Questions for Practice.

=>>Python Strings

1. Write a Python program to find all occurrences of a substring within a string.
2. Create a program to encrypt a string using the Caesar cipher (shifting characters by a certain number).
3. Write a function to find the longest substring without repeating characters in a given string.
4. How would you implement a function that performs string compression by counting repeated characters?
5. Create a program that converts a sentence into title case (capitalize the first letter of each word).
6. Write a Python function to check if two strings are rotations of each other.
7. How can you implement a function that performs string permutation (all possible rearrangements of characters)?
8. Write a program to find the second most frequent character in a string.
9. Create a function to find the minimum window in a string that contains all the characters of another string.
10. How do you reverse words in a sentence without reversing the characters in Python?

=>>Python Lists

1. Write a program to find the subarray with the maximum sum in a given list of integers.
2. Create a function that rotates a list by a specified number of steps.
3. How do you implement a function that performs list flattening (flattens a nested list)?
4. Write a Python program to generate all possible permutations of a list's elements.
5. Create a program to find the kth smallest element in an unsorted list.
6. How would you merge two sorted lists into a single sorted list efficiently?
7. Write a function to find the intersection of multiple lists.
8. Create a program that removes elements from a list while iterating through it.
9. How do you implement a function that returns all subsets of a given list?
10. Write a Python program to sort a list of lists based on the length of each sublist.

=>>Python Tuples

1. Write a Python program to convert a tuple to a dictionary.
2. Create a function to find the index of the first occurrence of an element in a tuple.
3. How can you concatenate multiple tuples into a single tuple?
4. Write a program to convert a list of tuples into a dictionary.
5. Create a function that removes elements from a tuple by value and returns a new tuple.
6. Write a Python program to check if two tuples have any elements in common.
7. How do you unzip a list of tuples into separate lists in Python?
8. Create a program to find the maximum product of two elements in a tuple.
9. How would you find the difference between two tuples in Python?

10. Write a Python program to find the number of occurrences of an element in a tuple.

=>>Python Sets

- 1. Write a program to perform the Cartesian product of multiple sets.**
- 2. How do you implement a function that checks if a set is a proper subset of another set?**
- 3. Create a function to find the symmetric difference between multiple sets.**
- 4. Write a Python program to remove duplicate sets from a list of sets.**
- 5. How can you efficiently check if two sets are equal in Python?**
- 6. Create a program to perform a union operation on an arbitrary number of sets.**
- 7. How do you implement a function that checks if a set is a superset of multiple sets?**
- 8. Write a Python program to find the intersection of multiple sets.**
- 9. How would you remove specific elements from a set without affecting its original set?**
- 10. Create a program to find the maximum and minimum elements in a set.**

=>>Python Dictionaries

- 1. Write a Python program to extract a subset of a dictionary based on keys.**
- 2. How do you merge two dictionaries and handle conflicts for the same keys?**
- 3. Create a function to sort a dictionary based on its values.**
- 4. Write a program to find common keys in multiple dictionaries.**
- 5. How can you find the dictionary key that has the maximum value in a dictionary?**
- 6. Create a program to group a list of dictionaries by a specific key.**
- 7. How do you update multiple keys in a dictionary with the same value efficiently?**
- 8. Write a Python program to find the length of the longest key in a dictionary.**
- 9. Create a function that combines values of the same key in a list of dictionaries.**
- 10. How would you remove items from a dictionary based on certain conditions?**

=>>Python If...Else

- 1. Write a program to check if a given string follows a specific pattern using regex and if-else statements.**
- 2. How do you implement a function that checks if a number is a perfect square using if-else statements?**
- 3. Create a program to check if a number is a palindrome and a prime number simultaneously using if-else statements.**
- 4. Write a Python program to find the largest among four numbers using if-else statements.**
- 5. How can you categorize a person's BMI (Body Mass Index) using if-else statements based on their input weight and height?**
- 6. Create a program to check if a given year is a leap year using both if-else and nested if-else statements.**
- 7. Write a Python program to determine the oldest and youngest person among a list of dictionaries using if-else statements.**
- 8. How would you implement a function that sorts three numbers without using conditional statements like if, else, or switch-case?**

9. Create a program to check if a triangle is equilateral, isosceles, or scalene using if-else statements.
10. Write a Python program to calculate income tax based on different tax slabs using if-else statements.

=>>Python While Loops

1. Write a Python program to find the factorial of a number using a while loop without using recursion.
2. Create a program to print the Fibonacci series using a while loop with a specified number of terms.
3. How can you find the smallest divisor of an integer using a while loop?
4. Write a program to calculate the power of a number using a while loop.
5. Create a function to find the HCF (Highest Common Factor) of two numbers using a while loop.
6. How do you implement a number guessing game using a while loop?
7. Write a Python program to compute the square root of a number using a while loop.
8. Create a program to reverse a number using a while loop.
9. How would you print numbers in a specific pattern using a while loop?
10. Write a Python program to count the number of digits in a given number using a while loop.

=>>Python For Loops

1. Write a program to find all prime numbers between two given numbers using a for loop.
2. How do you implement a nested loop to create a pattern of numbers in Python?
3. Create a program to find the factorial of numbers from 1 to n using a for loop.
4. Write a Python program to print Pascal's triangle using a for loop.
5. How can you print a pyramid pattern using numbers using a for loop?
6. Create a program to calculate the sum of numbers in a given range using a for loop.
7. Write a Python program to print all Armstrong numbers in a given range using a for loop.
8. How would you print numbers in a triangular pattern using a for loop?
9. Create a program to print the multiplication table of a given number using a for loop.
10. Write a Python program to generate a sequence of numbers but skip numbers that are divisible by 3 using a for loop.

=>>Python Functions

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1. Write a Python function to calculate the nth term of the Fibonacci series using recursion.
2. How do you implement a function to check if a given string is a palindrome using recursion?

3. Create a program to calculate the LCM (Least Common Multiple) of two numbers using a recursive function.
4. Write a Python function to calculate the power of a number using recursion.
5. How can you implement a recursive function to perform binary search in a sorted list?
6. Create a program to find the sum of natural numbers up to a given number using recursion.
7. Write a Python function to find the GCD (Greatest Common Divisor) of two numbers using recursion.
8. How do you implement a recursive function to print the Fibonacci series?
9. Create a program to find the factorial of a number using both recursion and iteration and compare their performance.
10. Write a Python function to calculate the sum of digits in a number using recursion.

=>>Python Lambda

1. Write a Python program to sort a list of tuples based on the sum of their elements using lambda functions.
2. How do you use lambda functions with the filter() function to filter odd numbers from a list?
3. Create a program to sort a list of dictionaries based on a specific key using lambda functions.
4. Write a Python program to filter a list of strings based on their length using lambda functions.
5. How can you use lambda functions with the map() function to convert a list of integers to their squares?
6. Create a program to sort a list of strings based on the last character using lambda functions.
7. Write a Python program to find the average of a list of numbers using lambda functions.
8. How do you use lambda functions with the sorted() function to sort a list of strings ignoring case sensitivity?
9. Create a program to sort a list of tuples based on the second element using lambda functions.
10. Write a Python program to filter a list of dictionaries based on a specific value using lambda functions.

=>>Python RegEx

1. Write a Python program to validate an email address using regex.
2. How can you extract text between two specific words in a string using regex?
3. Create a program to validate a username using regex (rules: alphanumeric characters and underscore, no special characters, minimum length 4).
4. Write a Python program to extract data from a log file using regex.
5. How do you match specific patterns within a multiline text using regex in Python?
6. Create a program to validate a credit card number using regex.
7. Write a Python program to extract numbers from a string using regex.

8. How can you remove HTML tags from a string using regex in Python?
9. Create a program to validate a date in YYYY-MM-DD format using regex.
10. Write a Python program to replace all occurrences of a word in a string using regex.

=>>Python Try...Except

1. Write a Python program to handle multiple exceptions using a single except block.
2. How do you handle division by zero errors in Python using try-except?
3. Create a program to handle KeyboardInterrupt using try-except.
4. Write a Python program to handle MemoryError using try-except.
5. How can you handle FileExistsError while creating a file using try-except?
6. Create a program to handle exceptions raised due to invalid typecasting using try-except.
7. Write a Python program to handle exceptions when opening a file for reading using try-except.
8. How do you handle exceptions related to invalid input while working with user-defined functions using try-except?
9. Create a program to handle exceptions raised due to index errors using try-except.
10. Write a Python program to handle exceptions while performing arithmetic operations using try-except.

=>>Python String Formatting

1. Write a Python program to format a string with placeholders and alignment.
2. How do you format a string to display numbers in scientific notation with a specific precision in Python?
3. Create a program to display floating-point numbers with a specified number of decimal places using string formatting.
4. Write a Python program to format a string with named placeholders.
5. How can you format a string to display both text and numbers with a specific width in Python?
6. Create a program to display integers with leading zeros and a specified width using string formatting.
7. Write a Python program to display strings in uppercase, lowercase, and title case using string formatting.
8. How do you align strings to the right, left, or center with a specified width using string formatting?
9. Create a program to display a string with padding characters on both sides using string formatting.
10. Write a Python program to display a string with a specified width and truncate if it exceeds the width using string formatting.

=>>File Handling

1. Write a Python program to read and write binary files using file handling.
2. How do you handle UnicodeEncodeError while writing to a file in Python?

- 3. Create a program to read a CSV file, modify its contents, and write the updated data back to the file using file handling.**
- 4. Write a Python program to read the last N lines of a text file using file handling.**
- 5. How can you create a file if it doesn't exist and append data to it using file handling?**
- 6. Create a program to count the occurrences of a specific word in a text file using file handling and regex.**
- 7. Write a Python program to read a JSON file, modify its content, and write the updated data back to the file using file handling.**
- 8. How do you handle file access errors in Python while working with file operations?**
- 9. Create a program to read a file, remove empty lines, and write the modified content back to the file using file handling.**
- 10. Write a Python program to read a text file, reverse its content, and write the reversed content to another file using file handling.**