PLACEMENT REFRESHER PROGRAM
Python Question Bank

VARIABLES, KEYWORDS, IDENTIFIER

1. What is the maximum possible length of an identifier ?
2. Which of the following is an invalid variable ?
    a. my_string_1
    b. 1st_string
    c. foo
    d. _
3. Can we use local variable names beginning with an underscore ? Justify your answer.
4. Are all keywords in Python Capitalized ?
5. How many keywords are available in Python ?
6. Which of the following is invalid ?
    a. it = 100
    b. on = 200
    c. in = 'Hi'
    d. apple = mango

OPERATORS

1. If you want to find out the value of x to the power of y then what operator will you use and what is the syntax of the same ?
2. What is the value of the following Python expressions ?
    a. 20 / 5
    b. 20.0 / 5
    c. 20.0 / 5.0
    d. 20 // 5
3. What is the order of precedence in Python ?
4. What is the value of the following Python expressions ?
    a. 3*1**3
    b. 2**(3**2)
    c. (2**3)**2
    d. 2**3**2
5. What does ~4 evaluate to ?
6. What does 3^4 evaluate to ?

DATA TYPES -STRINGS

1. Write a Python Program to check whether a given string is a palindrome or not.
2. Write a program to find the longest common prefix from a given set of strings.
3. Write a program to convert a given roman numeral to integer.
4. Write a program to convert a sentence into its equivalent mobile numeric keypad sequence.
5. Write a program to find the smallest palindromic number greater than **num** using the same set of digits as in **num**.
6. Given two strings, string, and pattern, the task is to find the smallest substring in the string containing all characters of pattern.
7. Write a program to print all anagrams together from a given set of strings.
8. Given a string consisting of opening and closing parenthesis, find the length of the longest valid parentheses substring.
9. Given an array of string **words** and a width **maxWidth**, format the text such that each line has exactly maxWidth characters and is fully (left and right) justified. You should pack your words in a greedy approach; that is, pack as many words as you can in each line. Pad extra spaces ' ' when necessary so that each line has exactly maxWidth characters.
10. Given a string **s**, reverse only all the vowels in the string and return it.

DATA TYPES - LIST, TUPLE, SET

1. Write a program to flatten a given nested list.
2. Write a program to count unique values inside a list
3. Write a program to find product the list product excluding the duplicates
4. Write a program to check if the list contains three consecutive common numbers in Python
5. Write a program to print all Possible Combinations from the three Digits
6. Write a program to Filter the List of String whose index in second List contains the given Substring
7. Write a program to Convert Character Matrix to single String
8. Given a m x n grid filled with non-negative numbers, find a path from top left to bottom right, which minimizes the sum of all numbers along its path.

   Note: You can only move either down or right at any point in time.
9. Write a program to find the intersection of two lists. Solve using three approaches.

DATA TYPES - DICTIONARY

1. Write a program to sort a dictionary based on keys and values.
2. Write a program to handle missing keys in Python Dictionaries.
3. Write a program to create a Grade Calculator in Python.
4. Write a program to Group Similar items to the Dictionary Values List.
5. Write a program for Counting the frequencies in a list using a dictionary in Python.
6. Write a program to Convert Nested dictionary to Mapped Tuple
7. Write a program to build an undirected graph and find the shortest path using Dictionaries.

CONTROL STRUCTURES

1. What will be the output of the following Python code?

```
x = ['ab', 'cd']
for i in x:
    x.append(i.upper())
print(x)
```

2. Write a Python program to find those numbers which are divisible by 7 and multiples of 5, between 1500 and 2700
3. Write a Python program to construct the following pattern, using a nested for loop.

```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
```

4. Write a Python program that prints each item and its corresponding type from the following list.

   Sample List : datalist = [1452, 11.23, 1+2j, True, upGrad, (0, -1), [5, 12], {"class":'V', "section":'A'}]
5. Write a Python program to get the Fibonacci series till a given integer **n**.
6. Write a Python program that iterates the integers from 1 to 50. For multiples of three print "up" instead of the number and for multiples of five print "Grad". For numbers that are multiples of three and five, print "upGrad".

   Sample Output :
   upGrad
   1
   2
   up
   4
   Grad
7. Write a Python program that accepts a sequence of comma separated 4 digit binary numbers as its input. The program will print the numbers that are divisible by 5 in a comma separated sequence.

   Sample Input: 0100,0011,1010,1001,1100,0101
   Sample Output : 1010, 0101

8. Write a Python program to check the validity of passwords input by users.

   Validation :

- At least 1 letter between [a-z] and 1 letter between [A-Z].
- At least 1 number between [0-9].
- At least 1 character from [$#@].
- Minimum length 6 characters.
- Maximum length 16 characters.

9. Write a Python program to calculate a dog's age in dog years.

   Note: For the first two years, a dog year is equal to 10.5 human years. After that, each dog year equals 4 human years.

   Sample Output:

   Input a dog's age in human years: 15

   The dog's age in dog's years is 73

10. Write a Python program to check if a triangle is equilateral, isosceles or scalene.

    Note :

    An equilateral triangle is a triangle in which all three sides are equal.

    A scalene triangle is a triangle that has three unequal sides.

    An isosceles triangle is a triangle with (at least) two equal sides.

    Sample Output:

    Input lengths of the triangle sides:

    x: 6

    y: 8

    z: 12

    Scalene triangle

11. Write a Python program to get the next day of a given date.

    Expected Output:

    Input a year: 2016

    Input a month [1-12]: 08

    Input a day [1-31]: 23

    The next date is [yyyy-mm-dd] 2016-8-24

12. Write a Python program to construct the following pattern, using a nested loop number.

    Expected Output:

    1

    22

    333

    4444

    55555

    666666

13. Write a program to find out the factorial of a given number.

FUNCTIONS

1. Write a Python function to calculate the factorial of a number (a non-negative integer). The function accepts the number as an argument.
2. Write a Python function that accepts a string and counts the number of upper and lower case letters.
3. Write a Python function that takes a list and returns a new list with distinct elements from the first list.
4. Write a Python function that takes a number as a parameter and checks whether the number is prime or not.
5. Write a Python program that accepts a hyphen-separated sequence of words as input and prints the words in a hyphen-separated sequence after sorting them alphabetically.
6. Create a function that calculates the result of raising a number to a given power without using the built-in ** operator.
7. Write a program to find fibonacci series upto n using lambda function.
8. Write a program to find the Number Occurring Odd Number of Times using Lambda expression and reduce function.

OBJECT ORIENTED PROGRAMMING

1. Write a Python program to create a class that represents a shape. Include methods to calculate its area and perimeter. Implement subclasses for different shapes like circle, triangle, and square.
2. Write a Python program to create a class representing a stack data structure. Include methods for pushing and popping elements.
3. Write a Python program to create a class representing a queue data structure. Include methods for enqueuing and dequeuing elements.
4. How much memory does a class occupy ?
5. What is a constructor ?
6. What is a destructor ?
7. Are class and structure the same? If not, what's the difference between a class and a structure ?
8. What is the difference between Overloading and Overriding ?
9. What is an abstract class ?
10. How is an abstract class different from an interface ?