PP2017

From WIKI 2017
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Programming Problems repository for first year students

1. Find the given number is even or odd?
2. Print the grade based on the percentages given, following is the grading criteria.
   >= 95 - Ex
   >=90 and < 95 - A+
   >=85 and < 90 - A
   >=80 and < 85 - B+
   >=75 and < 80 - B
   >=70 and < 75 - C
   <70 - F
3. Find the given year is Leap year or not?
4. Given a string, Print it for ten times.
5. Given two numbers a and b, swap values of a with b and b with a.
6. Find the length of given string? (There is a '\0' character at the end of the given string
7. Find the mean for the given set of numbers?
8. Find vowels and consonants in a given string?
9. Search for a number in given set of numbers?
10. Convert given temperature from degrees to fahrenheit?
11. Given two numbers a and b, find a power b?
12. Print first n natural number
13. Print even numbers from 2 to n
14. Find the reverse of a given string?
15. Find the given number is prime or not?
16. Find sum of digits for a given number?
17. Find all factors of a given number?
18. Find factorial of a given number?
19. Find median for given set of numbers?
20. Find mode for given set of numbers?
21. Find nth Ethiopian number?
22. Convert given number from time (HH:MM:SS) to seconds?
23. Print the following series based on the value of N
    For Example: If N is 4
    1
    2 3

3 4 5
4 5 6 7

24. Find a given credit card number is valid or not? Following are conditions.
    a. Credit Card Number should not start with 0.
    b. Credit Card Number should contain 16 digits.
25. Print “Hello” if the number is divisible by 3 and print “World” if the number is divisible by 5 and Print “Hello World” if the number is divisible by both 3 and 5 else print the number, for first 100 numbers.
26. Print first n Fibonacci numbers.
27. Check whether given string is palindrome or not?
28. Find the nth prime number?
29. Find the LCM of the given numbers?
30. Find the GCD of the given two numbers?
31. Find the prime factors of the given number?
32. Check whether the given number is Armstrong or not?
33. Find the nearest tidy number below n. Tidy number means all the digits in the number must be in increasing order.
34. Calculate number of 7’s in between 1 and 100?
35. Find the nth reversible prime number? (The first reversible prime is 11 and the second is 13 and etc).
36. Find the non-repeated(unique) numbers from a given set of numbers?
37. Find the greatest product of 3 consecutive digits in the given 6 digit number.
38. Find the sum of all the primes not greater than given N.
39. Given a decimal number, convert it in to Roman numbers.
40. Given a number, print the number in words.
41. Convert the given sentence to proper case.
42. Find the Largest alphabetical sequence in a given string.
43. Find the nth Ramanuja number.
44. Given a set of ints, print true if the set length is 1 or more, and the first element and the last element are equal.
45. We'll say that a 1 immediately followed by a 3 in a given set of numbers is an "unlucky" 1. print true if the given set contains an unlucky 1 in the first 2 or last 2 positions in the set.
46. Given a set of numbers with length n, print true if it does not contain a 2 or 3.
47. print the number of even numbers in the given set of numbers .
48. Given a set of numbers, print true if every 2 that appears in the set is next to another 2.
49. Given 3 int values, a b c, return their sum. However, if any of the values is a teen -- in the range 13..19 inclusive -- then that value counts as 0, except 15 and 16 do not count as a teens.
50. Write a program that accepts two non-negative integers, and return true if they have the same last digit. Example: 27 and 57return True.
51. Write a program that accepts user input a string, and an integer n. Display all characters that are in nth index and in multiples of n.
52. Write a recursive program that returns number of ears for a given number of bunnies each bunny has 2 ears only. Don’t use multiplication or looping, use only recursion to find solution.
53. Write a program to compute sum of the factorials of each digit of a given integer.
54. Write a program to convert every alternative character in a given string to upper case. Example: string = Hello World, output HElLo WOrLd. Special characters like space and

already upper case characters remain unchanged.

55. Write a program which returns True if a given integer is circular prime (otherwise return False). Circular prime is an integer for which each circular rotation is also a prime number. Example 1:n=31 is a circular prime. (31 rotated becomes 13 and they both are circular primes). Example 2: n=197, circularly rotated to 971, circularly rotated to 719 all are primes.
56. Write a program which returns True if a given string has all characters in alphabetic order (otherwise return False).
57. Write a program to compute largest product using any 3 digits of given integer.
58. Write a program to compute smallest number that can be formed using all the digits of a given integer.
59. Write a program to rotate the list left by n times.
60. Write a program to find the mean and mode for the given list of elements.
61. Write a program to remove duplicates from a list.
62. Write a program that returns True if the given elements in two lists are same. (The elements can be in any order, You should not sort the lists using in-built methods).
63. Write a program to calculate the first 26 Fibonacci numbers and assign each Fibonacci number a letter in English as a value by using Dictionaries. Given a string as input and calculate the sum of all the characters that are associated with the values from the given string. Write a recursive function for finding the Fibonacci numbers.
64. Write a program to find the second largest and second smallest numbers from the given list of numbers. (You should not use in-built method).
65. Write a recursive program to compute the sum of all numbers in the nested lists. Elements of the list could be a number or list of numbers.
66. Write a program to calculate exponent of a given number and compute the digit sum of the result.
67. Write a program to find the median of the given list of numbers. Use Mergesort to sort the elements of the list.
68. Write a program to implement the following operations for Wallet class.
    Data Attributes of the wallet class should be: amount.
    Behaviors of the Wallet class should be as follows.
        1. addMoney() #Adding money to the wallet.
        2. payMoney() #Paying money from the wallet.
        3. checkBalance() # Return the current amount from the wallet.
    Note: Don't consider negative numbers, when adding or paying money.
    Note: money can be float (23 rupees 43 paisa = 23.43)
    Ex: input wallet.add(9)
    Ex: output wallet.check() //should return 9
69. Write a program to implement the following operations for Set class.
    Data attribute of the set should be: list
    Behaviors of the set class should be as follows.
        1. addElement(element) # Adds the element to the set if it not in the set.
        2. union(other): # performs union of two sets and returns a new set.
        3. intersect(other): # perform intersection of two sets and returns a new set.
70. Given a set of numbers, print true if it does not contain 2 or 3.
71. Sum all the odd digits of a given number
72. Given Principle amount (p), rate of interest (r), number of times the interest is compounded per year (n) and time (t) (in years). Calculate the annual compound interest.

Formula is as follows

A = P (1 + r/n) (nt)

73. Print True if the first string ends with the second string.
74. Print True, if one set is the subset of the other
75. Find the sum of first n even Fibonacci numbers.
76. Print the intersection of the two given sets. (No duplicate elements in each set)
77. Find all unique vowels from the given string
78. Find the sum of the prime factors of the given number.
79. Find the lucky number for the given string.

```
Explanation:
     Ascii values of upper case letters range from 65 to 90
     Ascii values of lower case letters range from 97 to 122
     So, for the given string, MSIT: (77 + 83 + 73 + 84) = 317
     (3 + 1 + 7) = 11
     (1 + 1) = 2
```

80. Write a program which performs all arithmetic operations (addition, subtraction, multiplication, division, modulo) on the variables a = 25, b = 15. Also, display the results.
81. Evaluate the following expression and display the output of operation performed for each step. (a+b*c+d)/(a*b-c) for the values a = 16, b = 59, c = 48, d = 37.
82. Write a program that takes a string input from user, displays the string without the first and last characters. For example, if the input is 'computer', the output should be 'ompute'.
83. Write a program to find if the given date is from leap year or not. Input format: dd-mm-yyyy Expected output: leap year (or) not a leap year
84. Write a program to print the multiplication table using for loop
85. Write a program to find sum of n even numbers using while loop, where n is the input
86. Write a program to convert binary to decimal number
87. Write a program to find if the given number is a perfect cube or not using guess and check algorithm
88. Write a program to find the square root of the given number using approximation method
89. Write a program to find the square root of the given number using Bi-section method
90. Write a program to find the square root of the number using Newton-Rapson method
91. Write a program in which it takes your name using standard input and pass it to a user defined function which print it on to the screen
92. Write a user defined function which takes a string as an argument and return the reverse of the given string
93. Write a user defined function which takes a single argument(integer) and prints whether it is even or odd. Next create a user defined function which swaps the values of x and y i.e., x=3, y=2. Now print the values of x and y inside the function Finally, print x and y values after the function call i.e., x=2 , y=3(After doing this problem, you'll have a clear picture about scope of variables.
94. Write a program which uses previously defined functions in problems 2 &3 to print the reverse of a string and numbers after swapping.
95. Implement a program to print following pattern iteratively.

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

```
* * * * *
```

96. Implement a program to print 10 to 1 numbers using recursion.
    Sample output: 10 9 8 7 6 5 4 3 2 1
97. Implement a program to print sum of individual digits using:
    a)while loop
    b)for loop

98. Implement a program to print ‘n’ elements of Fibonacci series recursively
99. Concatenate two given tuples and print the result.
100. Create a tuple with weekdays as elements. Print the elements of tuple using iterator.
101. Write a python script to find the minimum, maximum, length and convert the tuple into a list using predefined funtions.
102. Check whether an element exists in a given tuple using predifined function.
103. Check whether two integer lists are similar using predefined fucntion.
104. Print the even numbers in an integer list.
105. When two integer lists 'a' and 'b' are given, create a new list containing middle elements of the given lists 'a' and 'b'.
106. Create a list and square root function , write a function which takes the list and square root function as arguments and replace elements of list with the square root value of the element
107. Create a dictionary with integer value as key and equivalent word as value. And get the value of a given key.

```
dict = {1:'one',2:'two'}
print dict[1]
Output: one
```

108. Given a string, create a dictionary with characters as keys and count(frequency) of each character as value.
109. For the above created dictionary there might be several letters with similar count, create a new dictionary with frequency as keys and values as list of characters with similar frequencies. New Dictionary: {2:['r','m'],3:['m'],1:['b']}
110. Implement a program for square root of a given number by raising and handling an exception if number is negitive.
111. Write a program to register for attending a party if their age lies between 18 and 35, allow for registration else raise a UserDefined exception.
112. Implement a program to raise an assertion error if the given number is negative else print the given number table.
113. Determine best, worst and average time complexities for linear search algorithm.

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