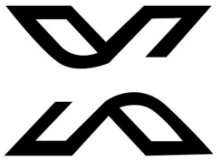

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Date	Sep-10-2024	Session No	x

Topic : Problem solving using Python - Functions, loops

Assignment: Python Programming Questions

Loops Questions

1. **While Loop**
    - Write a while loop to print the numbers from 1 to 10, but skip the number 7.
    - Use a while loop to print "Hello, World!" a number of times equal to the length of the word "Programming".
    - Write a program that uses a while loop to print the numbers 1 to 10, but stop the loop if the number is divisible by 4.
    - Write a while loop that prints the numbers 1, 2, 3, 4, and 5 in reverse order, stopping when the loop reaches 3.
    - Use a while loop to print the first 5 multiples of 3, but break the loop if the multiple is greater than 9.
    - Write a while loop that prints every alternate letter in the word "Python" starting from the first letter.
    - Create a program that uses a while loop to calculate and print the factorial of a given number (e.g., 5!).
    - Write a while loop to iterate through a list of fruits `['apple', 'banana', 'cherry']`, and print each fruit in uppercase, but stop when you encounter 'banana'.

- Use a while loop to print numbers from 10 down to 1, but skip all odd numbers.
- Write a while loop that prints only the even numbers from 1 to 20, but break the loop if the number is divisible by 8.

2. **For Loop**
   - Write a for loop to print the numbers from 1 to 5.
   - Use a for loop to print "Hello, World!" five times.
   - Write a program that uses a for loop to print the numbers 1 to 10 on the same line.
   - Write a for loop that prints the numbers 1, 2, 3, 4, and 5, but stops the loop when it reaches 3.
   - Use a for loop to print the first 5 multiples of 2 (i.e., 2, 4, 6, 8, 10).
   - Write a for loop that prints all the letters in the word "Python" one by one.
   - Create a program that uses a for loop to print the sum of numbers from 1 to 5.
   - Write a for loop to print each element of the list `['apple', 'banana', 'cherry']`.
   - Use a for loop to print the numbers from 10 down to 1.
   - Write a for loop to print only the even numbers from 1 to 10.
3. **Basic String Manipulation**
   - Create a string `s = "Hello"`. Write a program to print this string.
   - Write a Python program to join two strings "Good" and "Morning" with a space in between.
   - Create a string variable `name = "John"`. Write a program to print the first letter of the name.
   - Write a program that converts the string `"apple"` to uppercase.
   - Create a string `s = "Python"`. Write a program to print the length of this string.
   - Write a program to combine the strings `"First"` and `"Last"` to form `"FirstLast"`.
   - Create a string `s = "banana"`. Write a program to print the last letter of the string.
   - Write a program to check if the string `"cat"` is present in the string `"caterpillar"`.
   - Create a string `s = "Hello"`. Write a program to print the string in reverse order.
   - Write a program to print each letter of the string `"WORLD"` on a new line.

Additional Loops Questions

1. **Print Specific Numbers**
    - Print the numbers from 1 to 10, but skip the number 7.
    - Print "Hello, World!" 11 times (since "Programming" has 11 letters).
    - Print the numbers from 1 to 10, but only print them if they are not divisible by 4.
    - Print the numbers 5, 4, 3, 2, 1.
    - Print the first 5 multiples of 3.
    - Print every other letter in the word "Python".
    - Print the factorial of 5 (5 * 4 * 3 * 2 * 1).
    - Print the names of fruits in a list like `['apple', 'banana', 'cherry']`.
    - Print the numbers from 10 to 1, but only print the even numbers.
    - Print the even numbers from 1 to 20.
2. **Advanced Loops**
    - Write a Python program to print all multiples of 5 between 5 and 50.
    - Write a Python program to print the first 10 multiples of 3.
    - Write a Python program to print all even numbers between 1 and 20.
    - Write a Python program to print the squares of numbers from 1 to 10.
    - Write a Python program to print all odd numbers between 1 and 30.
    - Write a Python program to print all numbers divisible by 9 between 10 and 100.
    - Write a Python program to print all multiples of 8 between 1 and 80.
    - Write a Python program to print the first 15 multiples of 4.
    - Write a Python program to print all numbers between 50 and 100 that are divisible by 10.
    - Write a Python program to print all prime numbers between 1 and 50.

Functions

1. **Basic Functions**
    - Write a function `sum_list(numbers)` that takes a list of numbers as input and returns the sum of all the elements in the list.
    - Create a function `find_max(numbers)` that takes a list of numbers as input and returns the largest number in the list.
    - Write a function `reverse_list(items)` that takes a list as input and returns a new list with the elements in reverse order.
    - Write a function `count_occurrences(items, target)` that takes a list and an element as input and returns the number of times the element appears in the list.
    - Write a function `multiply_by(numbers, n)` that takes a list of numbers and a single number `n`, and returns a new list where each element of the original list is multiplied by `n`.
2. **Intermediate Functions**

- Write a Python function `print_multiples(start, end, multiple)` that prints all multiples of `multiple` between `start` and `end`.
- Write a Python function `generate_range(start, end, step)` that returns a list of numbers from `start` to `end` (exclusive) with a step of `step`.
- Write a Python function `print_squares(n)` that prints the squares of numbers from 1 to `n`.
- Write a Python function `print_multiples_in_range(start, end, multiple)` that prints all multiples of `multiple` within the range from `start` to `end`.
- Write a Python function `is_divisible(number, divisor)` that returns True if the `number` is divisible by `divisor`, otherwise False. Use this function to print all numbers between 50 and 150 that are divisible by 7.

3. **Prime Numbers and Ranges**
   - Write a Python function `is_prime(n)` that returns True if `n` is a prime number. Use this function to print all prime numbers between 1 and 50.
   - Write a Python function `print_odd_numbers(start, end)` that prints all odd numbers between `start` and `end`.

Complex Questions

1. **Product and Prime Functions**
   - Write a Python function `cumulative_product(numbers)` that takes a list of numbers and returns a new list where each element is the cumulative product of the elements in the input list.
   - Create a Python function `divisible_in_range(start, end, divisors)` that takes a starting and ending number, as well as a list of divisors. The function should return a dictionary where the keys are the divisors and the values are lists of numbers in the range [start, end] that are divisible by each divisor.
2. **Factorials and Multiples**
   - Write a Python program that generates a list of factorials for numbers in a given range [a, b], and returns the number with the maximum factorial value in that range.
   - Create a Python function `find_common_multiples(range1, range2)` that finds all common multiples of numbers in two different ranges. The function should return a list of common multiples between the two ranges.

END