Python Looping Assignments

Focus: `for`, `while`, and nested loops

🔹 Section A: Simple Looping Questions

1. **Print Numbers from 1 to N**
   - Input `N` and print all numbers from 1 to `N`.

   Hint: Use `for i in range(1, N+1):`

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2. **Sum of First N Natural Numbers**
   - Input `N` and print the sum `1 + 2 + ... + N`.

   Hint: Use a loop to add each number to a `total` variable.

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3. **Print Multiples of 3 up to N**
   - Input `N` and print all multiples of 3 up to `N`.

   Hint: Use `if i % 3 == 0:` inside loop.

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4. **Count Digits in a Number**
   - Input a number and count how many digits it has.

   Hint: Use `while number > 0:` and divide by 10 each time.

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5. **Reverse a Number**
   - Input a number, and print its reverse.

   Hint: Use `% 10` to get last digit, and `// 10` to shorten the number.

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6. **Check if a Number is Prime**
   - Input a number and check if it's prime or not.

   Hint: A number is prime if it has no divisors other than 1 and itself.

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7. **Find Factorial of a Number**
   - Input `n` and print `n!`.

   Hint: Multiply all numbers from `1 to n`.

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8. **Find All Factors of a Number**
   - Input a number and print all its factors.

   Hint: Loop from 1 to `n` and check `n % i == 0`.

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9. **Sum of Digits**
   - Input a number and print the sum of its digits.

   Hint: Use `% 10` to get each digit, then `// 10`.

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10. **Check Palindrome Number**
    - Input a number and check if it reads the same backward.

    Hint: Reverse the number and compare it with the original.

🔹 Section B: Applied Looping Logic

11. **Fibonacci Series up to N Terms**
    - Input `N`, and print the first `N` numbers in the Fibonacci series.

    Hint: Start with 0 and 1, then update using `a, b = b, a + b`.

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12. **Find LCM of Two Numbers**
    - Input two numbers and find their Least Common Multiple (LCM).

    Hint: Use loop starting from max(a, b) until you find a number divisible by both.

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13. **Find GCD of Two Numbers**
    - Input two numbers and find their Greatest Common Divisor (GCD).

    Hint: Loop from `1 to min(a, b)` and check for common divisors.

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14. **Check Armstrong Number**
    - Input a number and check if it's an Armstrong number.

    Hint: Raise each digit to the power of total digits and add them.

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15. **Print All Prime Numbers in a Range**
    - Input start and end, and print all prime numbers in that range.

    Hint: Use a nested loop: outer for range, inner to check prime.

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16. **Find the Smallest Digit in a Number**
    - Input a number and print the smallest digit.

    Hint: Extract each digit and compare using `min`.

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17. **Find the Largest Digit in a Number**
    - Input a number and print the largest digit.

    Hint: Extract digits with `% 10` and use `max`.

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18. **Check Perfect Number**
    - A number is perfect if the sum of its proper divisors equals itself.

    Hint: Add all divisors (except the number) and compare with original.

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19. **List All Divisors of a Number**
    - Input a number and list all numbers that divide it.

    Hint: Loop from 1 to `n` and check `n % i == 0`.

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20. **Find Sum of Even and Odd Digits Separately**
    - Input a number and calculate the sum of even digits and odd digits separately.

    Hint: Use `% 10` to get each digit and separate with `if digit % 2 == 0`.