Python Assignment- 1

1. Compute the prime factorization of numbers from 1 to N using dictionary comprehension.
2. Compute the sum of squares of unique even numbers from a nested list using set comprehension.
3. Find all numbers between 10 and 1000 whose sum of digits is a perfect square using list comprehension.
4. Extract all substrings of a given string that start and end with the same letter using set comprehension.
5. Create a dictionary mapping each lowercase English letter to its frequency in a given paragraph.
6. Generate an infinitely repeating sequence of prime numbers up to N using a cyclic generator.
7. Find all words in a given list that have at least one letter appearing twice.
8. Create a list of numbers that are both Fibonacci and triangular using list comprehension.
9. Create a dictionary mapping words in a sentence to their reversed versions if the reversed word also exists in the sentence.
10. Generate a dictionary of all numbers from 1 to N where the keys are numbers and the values are lists of their divisors.
11. Find the longest word in a sentence that does not contain repeating letters.
12. Find all numbers up to N that are both palindromes and congruent to 1 modulo 7 using list comprehension.
13. Generate a N × N magic square using list comprehension where the sum of each row, column, and diagonal is the same.
14. Construct a dictionary where each key is a number from 1 to N, and the value is its modular inverse mod M, if it exists.
15. Generate a grid where each cell contains the sum of unique prime factors of its row and column index using list comprehension.
16. Generate a dictionary mapping numbers to their binary and hexadecimal representations.
17. Generate a Pascal's triangle row using list comprehension.
18. Create a chessboard pattern using a nested list comprehension.
19. Generate the first N Fibonacci numbers as a tuple using comprehension-like constructs.
20. Compute the determinant of a 3×3 matrix using a nested list comprehension.

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