AI Pair Python Programming

Python Exercises for Senior Engineers (Built-in Libraries Only)

Using pair programming do any 7 questions from the below questions

1. Write a Python function that takes a list and returns a new list with unique elements of the first list.
2. Write a Python function to check whether a number is perfect or not.
3. Write a function that accepts a number as a parameter. The function should return a number that's the difference between the largest and smallest numbers that the digits can form in the number.
    a. For example, if the parameter is "213", the function should return "198", which is the result of 123 subtracted from 321.
4. Write a loop that prompts the user to enter a series of pizza toppings until they enter a 'quit' value. As they enter each topping, print a message saying you'll add that topping to their pizza.
5. A movie theater charges different ticket prices depending on a person's age. If a person is under the age of 3, the ticket is free; if they are between 3 and 12, the ticket is $10; and if they are over age 12, the ticket is $15. Write a loop in which you ask users their age, and then tell them the cost of their movie ticket.
6. Display the Fibonacci series with recursion and without recursion
7. Think of at least three kinds of favorite pizza. Store these pizza names in a list. Then use for loop to print the name of pizza.
    - Modify your for loop to print a sentence using the name of pizza instead of printing just name of pizza. For each pizza you should have one line of output containing a simple statement like I like pepperoni pizza.
    - Add a line at the end of program, outside the for loop, that states how much you like pizza. The output should consist of three or four line about the kind of pizza you like with additional sentence.
8. Define a loop that iterates over all numbers 0 through 9, and squares each number. Within this loop, at each iteration, check if the number is divisible by 2, at which point the loop will continue to execute otherwise print the output as below
9. What is an anagram and find if the two given strings are anagrams of each other
10. Python program to return a new set with unique items from both sets by removing duplicates.

Capstone Project

Using pair programming complete any 1 task

Task 1: Chatbot

Create a rule-based chatbot that responds to greetings, questions, and farewells.

- **Pattern matching with regular expressions**
- **Context awareness** (basic memory of previous user inputs)
- **Categorized responses** (greetings, questions, farewells, unknowns)

Task 2: AI-Powered Data Cleaning Assistant

Build a Python-based tool that automatically detects and resolves common data quality issues in structured datasets (e.g., CSV, Excel), improving data readiness for analysis or modeling (**House Price Prediction Dataset/e-commerce Dataset)**

- Missing Value Detection & Imputation
- Outlier Detection
- Data Type Correction
- Duplicate Detection