7-Day Python + NumPy + Pandas Course: Daily Mini Tasks

These are sample practice problems for students. Please feel free to add, remove and delete questions as per the topics covered each day.

## Day 1: Python Basics & Control Flow

1. Write a program to input two numbers and print their sum, difference, product, and quotient.

2. Check whether a given number is even or odd.

3. Print the first N natural numbers using a loop.

4. Write a program to find the factorial of a number.

5. Determine if a number is prime.

6. Display the multiplication table of a number.

7. Find the largest among three numbers using if-else.

8. Sum all even numbers from 1 to 100.

9. Calculate the electricity bill based on slab rates using conditions.

10. Input marks and print grade (A/B/C/Fail).

## Day 2: Functions, Lists, and Tuples

1. Define a function to compute the square of a number.

2. Write a function that returns the maximum number from a list.

3. Create a list of 10 numbers and sort it.

4. Find the sum of elements in a list using a function.

5. Create a list comprehension to generate squares of numbers 1 to 10.

6. Count occurrences of an element in a list.

7. Reverse a tuple using slicing.

8. Remove duplicates from a list using a function.

9. Define a function to check if a number is in a list.

10. Merge two lists without using "+" operator.

## Day 3: Strings, Sets, Dictionaries, and Lambda

1. Count vowels in a given string.

2. Check if a string is a palindrome.

3. Split a string into words and count them.

4. Convert a list of words to a single sentence.

5. Create a set of unique characters from a string.

6. Create a dictionary to count word frequency in a sentence.

7. Use lambda and map to square elements of a list.

8. Use lambda and filter to get only even numbers from a list.

9. Merge two dictionaries.

10. Use reduce to compute factorial of a number.

## Day 4: File Handling, Error Handling & Decorators

1. Write a program to read content from a text file.

2. Append user input to an existing file.

3. Count the number of lines in a file.

4. Handle division by zero using try-except.

5. Create a decorator that logs function calls.

6. Write a decorator that checks argument type.

7. Log error messages to a log file using try-except.

8. Count number of words in a file.

9. Write a program to copy content from one file to another.

10. Create a decorator to time function execution.

## Day 5: NumPy Essentials

1. Create a 1D NumPy array of numbers from 1 to 10.

2. Generate a 3x3 identity matrix.

3. Find the mean and standard deviation of an array.

4. Perform element-wise addition of two arrays.

5. Slice a 2D array to extract a submatrix.

6. Use broadcasting to add 1 to each row of a matrix.

7. Create a 5x5 matrix filled with random integers.

8. Compute dot product of two vectors.

9. Reshape a 1D array into 2D.

10. Create a boolean mask for elements greater than a threshold.

## Day 6: Pandas – Series and DataFrames – Choose appropriate data set

1. Create a Series from a list of numbers.

2. Access the first 5 elements of a Series.

3. Create a DataFrame from a dictionary.

4. Read a CSV file and display basic info.

5. Rename columns in a DataFrame.

6. Add a new column to a DataFrame.

7. Drop a column from the DataFrame.

8. Select rows based on condition.

9. Sort DataFrame by a column.

10. Filter rows where column value is missing.

## Day 7: Pandas Data Manipulation & Grouping – choose appropriate date set

1. Group data by category and calculate sum.

2. Fill missing values with column mean.

3. Drop rows with missing values.

4. Convert a date column to datetime type.

5. Extract year and month from datetime.

6. Filter data for a specific month.

7. Calculate average spend per category.

8. Create a pivot table from DataFrame.

9. Merge two DataFrames.

10. Save a modified DataFrame to CSV.