FILE HANDLING AND ARRAYS

Loading Data from Files

1. Write a Python script to open and read the contents of a text file called data.txt, then print its contents to the console.
2. Write a Python function that reads a file names.txt line by line and prints each name in uppercase.
3. Create a Python script to write a list of integers to a file called numbers.txt, with each number on a new line.
4. Read a CSV file called data.csv containing two columns: x_values and y_values. Extract the columns into two separate arrays.
5. Given a text file marks.txt containing student names and their scores (name, score), write a Python script to find the student with the highest score.
6. Write a Python function that appends new data to an existing file log.txt, ensuring that the new data is on a new line.
7. Write a Python program to count the number of words in a text file document.txt.
8. Load data from a file called matrix.txt containing a 3x3 matrix (one row per line). Use NumPy to store the matrix as a 2D array.
9. Write a Python script that reads a file data.csv with three columns (time, temperature, pressure), extracts the data, and stores it in a dictionary.
10. Write a Python program that reads from data.csv and calculates the average of the values in the second column.

Working with Arrays

11. Create a Python script that generates a NumPy array of random integers between 0 and 100 of size 10. Print the array and the sum of its elements.
12. Write a Python function that creates a 4x4 identity matrix using NumPy.
13. Given two NumPy arrays A and B of size 10, write a Python program to compute the element-wise sum of A and B.
14. Create a NumPy array of 100 evenly spaced values between 0 and 10. Print the array.
15. Write a Python function that accepts a 2D NumPy array and returns its transpose.
16. Write a Python program to calculate the dot product of two vectors (arrays) using NumPy.
17. Create a NumPy array of shape (3, 3) filled with random floats between 0 and 1. Print the array and its maximum value.
18. Given a NumPy array, write a Python function to find and print the index of the largest element.
19. Write a Python program to replace all even numbers in a NumPy array with zero.

20. Create a NumPy array of size 10 with values randomly sampled from a normal (Gaussian) distribution. Plot the histogram of the array using Matplotlib.