Python Data Dive Activities Unit 1.2

1. Write a Python program that dynamically creates a NumPy array with specified attributes (e.g., shape, data type). Allow user input for these attributes.

2. Create a Python program that uses Pandas to clean and prepare a dataset by handling missing values, duplicate records, and outliers.

3. Write a Python function to calculate the mean and standard deviation of a NumPy array.

4. Implement a Python program that uses NumPy broadcasting to perform an operation on two arrays of different shapes.

5. Create a Python script that utilizes NumPy to solve a system of linear equations, showcasing the application of linear algebra operations.

6. Write a Python program that generates a dataset with random values using NumPy. Allow users to control the randomness and specify the size of the dataset.

7. Develop a Python script that uses NumPy to simulate a real-world scenario where random data is essential (e.g., Monte Carlo simulation).

8. Calculate the matrix product of two NumPy arrays representing 2D matrices.

9. Create a NumPy matrix and find its determinant and inverse.

10. Control randomness by setting seeds and compare the results with different seed values.

11. Calculate the mean, standard deviation, minimum, and maximum values of a NumPy array.