TASK SHEET

1. Write a function that computes the element-wise square root of a NumPy array without using the numpy.sqrt function.
2. Implement a program that calculates the cross product of two 3D NumPy arrays representing vectors.
3. Create a function that takes a NumPy array as input and returns a new array with only the unique elements sorted in ascending order.
4. Write a program that reads a CSV file containing numerical data and calculates the covariance matrix using NumPy.
5. Develop a function that takes a NumPy array as input and returns the indices of the local minima (values smaller than both of their neighbors).
6. Implement a program that performs matrix transposition of a randomly generated NumPy array.
7. Create a function that takes a NumPy array as input and returns the cumulative sum along a specified axis.
8. Write a program that reads a text file containing numerical data and calculates the FFT (Fast Fourier Transform) using NumPy.
9. Develop a function that takes a NumPy array as input and returns the indices of the sorted elements in descending order.
10. Implement a program that calculates the element-wise exponential of a NumPy array without using the numpy.exp function.
11. Create a function that takes a NumPy array as input and returns the Pearson correlation coefficient matrix.
12. Write a program that performs polynomial fitting on a set of data points using NumPy.
13. Develop a function that takes a NumPy array as input and returns the indices of the sorted elements based on absolute values.
14. Implement a program that reads an audio file using NumPy and calculates the FFT to analyze its frequency content.
15. Create a function that takes a NumPy array as input and returns the indices where the elements are within a specified range.