Experiment – 8: Numpy and Pandas

Aim: To demonstrate the application of Image processing in Python using Scipy and Matplotlib.

Theory:

NumPy is the fundamental package for scientific computing in Python. It is a Python library that provides a multidimensional array object, various derived objects (such as masked arrays and matrices), and an assortment of routines for fast operations on arrays, including mathematical, logical, shape manipulation, sorting, selecting, I/O, discrete Fourier transforms, basic linear algebra, basic statistical operations, random simulation and much more.

Pandas is an open-source Python library that provides data structures and functions needed to manipulate and analyze structured data. Pandas is built on top of the NumPy library, which provides support for multi-dimensional arrays and mathematical functions. The main goal of Pandas is to make data manipulation and analysis more intuitive and easy to perform, especially when dealing with complex data structures.

Conclusion:

Task for submission:
(Write comments for every statement of the program)

1. Write Python program to demonstrate Numpy Library

    a. search maximum and minimum in the given array
    b. sort the elements in the given array
    c. find mean
    d. add rows and columns
    e. reverse the array
    f. multiply two matrices

2. Write Python program to demonstrate Pandas Library

    a. add, subtract, multiple and divide two Pandas Series.
    b. convert the first column of a DataFrame as a Series.
    c. to select the specified columns and rows from a given data frame.
    d. calculate the sum of the examination attempts by the students.
    e. append a list of dictionaries or series to a existing DataFrame and display the combined data.
    f. join the two given dataframes along rows and merge with another dataframe along the common column id.