Foundation of Data Science (CSD355)

Lab Assignment – 1

(Deadline: 28-08-2025)

Some basic programming questions on Numpy and Pandas

NumPy

1. Create a NumPy array of shape (4,5) filled with zeros.
2. For a given numpy array, print the number of dimensions, shape, and size of array.
3. Write code to generate a 1D NumPy array of 36 elements from 1 to 36 and reshape it into (3,4,3).
4. Create a NumPy array of shape (3,4) with all elements equal to 9.
5. For a given two-dimensional array (4*4), extract the third column as a separate 1D array.
6. Write Python code to calculate the sum of all elements in a (4x4) random integer NumPy array.
7. Given two NumPy arrays, perform element-wise addition, subtraction, and multiplication.
8. Write a NumPy program to compute the transpose of a matrix and verify its shape.

Pandas

9. Load a CSV file into a Pandas DataFrame and display the first 10 rows. (Select any dataset from Kaggle)
10. Write code to print the names of all columns and their data types from a DataFrame.
11. Extract only the salary column from the dataframe and calculate its mean.
12. Write Pandas code to display all rows by applying some filters on columns.
13. Select rows from index 10 to 20 and display only specific columns.
14. Replace values of a column when specific criteria are met.
15. Sort the DataFrame by considering one column in ascending order and then by another column in descending order.

Note: You can do more experimentation on the selected dataset and submit it to the Blackboard.