**Assignment 4 – NumPy and Pandas**

**Objective**

Understand the basics of NumPy arrays and Pandas DataFrames. Perform simple data manipulations and computations.

**Part 1: NumPy Basics**

**Tasks**

1. Import NumPy.
2. Create a 1D NumPy array with values from 10 to 50.
3. Create a 2D NumPy array of shape (3, 3) filled with random integers from 1 to 100.
4. Find the mean, median, and standard deviation of an array.
5. Perform element-wise addition and multiplication of two arrays.

**Example Code**

import numpy as np

# Task 2

arr1 = np.arange(10, 51)

print("1D Array:", arr1)

# Task 3

arr2 = np.random.randint(1, 101, (3, 3))

print("2D Array:\n", arr2)

# Task 4

print("Mean:", np.mean(arr1))

print("Median:", np.median(arr1))

print("Standard Deviation:", np.std(arr1))

# Task 5

a = np.array([1, 2, 3])

b = np.array([4, 5, 6])

print("Addition:", a + b)

print("Multiplication:", a \* b)

**Part 2: Pandas Basics**

**Tasks**

1. Import Pandas.
2. Create a DataFrame from a dictionary of student names and scores.
3. Add a new column for grades based on the score.
4. Filter students who scored more than 80.
5. Calculate the average score of the class.

**Example Code**

import pandas as pd

# Task 2

data = {

'Name': ['Alice', 'Bob', 'Charlie', 'David', 'Eva'],

'Score': [85, 72, 90, 66, 95]

}

df = pd.DataFrame(data)

print("DataFrame:\n", df)

# Task 3

def assign\_grade(score):

if score >= 90:

return 'A'

elif score >= 80:

return 'B'

elif score >= 70:

return 'C'

else:

return 'D'

df['Grade'] = df['Score'].apply(assign\_grade)

print("With Grades:\n", df)

# Task 4

high\_scorers = df[df['Score'] > 80]

print("Students with Score > 80:\n", high\_scorers)

# Task 5

average = df['Score'].mean()

print("Average Score:", average)

**Submission Guidelines**

* Save your work as a .py or .ipynb file.