**Assignment 4 - Fundamentals of Data Science**

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Module: Fundamentals of Data Science

Assignment: Week 7 & 8 Programming Tasks

# NumPy Array Operation

This program generates a NumPy array (e.g., [1, 2, 3, 4, 5]) and performs operations like summing the elements, calculating the average, and identifying maximum and minimum values.

Output  
A computer screen shot of a program

AI-generated content may be incorrect.

# 2. Sorting and Slicing User Input Array

This program takes an array of at least 10 elements from the user, sorts the array, and performs slicing operations to extract subsets of elements from specific index ranges (2-5, 5-8, 2-9).

Output  
A screenshot of a computer program

AI-generated content may be incorrect.

# 3. Random Integer Array and Reshaping

This program creates a NumPy array of random integers, sorts the array, and reshapes it into a matrix of feasible dimensions using the reshape function.

Output

A computer screen shot of a program

AI-generated content may be incorrect.

# 4. Matrix Operations with Validation

This program takes two matrices as input and performs matrix operations like addition, subtraction, and multiplication using NumPy. It includes size validation and handles mismatched dimensions with exceptions.

Output  
  
A screenshot of a computer program

AI-generated content may be incorrect.

# 5. Scatterplot from CSV using Pandas and Matplotlib

This program reads a CSV file ('weight\_height.csv') using Pandas and plots scatterplots for various column pairs using Matplotlib, such as weight vs height, age vs weight, etc.

Output

A screen shot of a computer

AI-generated content may be incorrect.A screenshot of a graph

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# 6. BMI and Risk Calculation with Pandas

This program reads 'weight\_height.csv' into a Pandas dataframe and adds two new columns: BMI (calculated as weight/height) and Risk, determined based on BMI ranges.

Output  
  
A screenshot of a computer

AI-generated content may be incorrect.