



Coding Blocks | Online



Machine Learning Online

Assignment - 3 Numpy, Pandas

Questions For Practice

Part-I Numpy Questions

Objective:

To build a strong foundation in using NumPy for numerical computations, including creating arrays, performing operations, and leveraging its powerful functionalities.

Assignment Tasks

Task 1: Creating Arrays

1. Write a Python program to:
 - Create a 1D NumPy array of 10 integers ranging from 1 to 10.
 - Create a 2D NumPy array of shape (3, 3) with integers from 1 to 9.

- Create a 3D NumPy array with random floating-point numbers of shape (3, 5, 3).
 - 2. Display the shape, size, and datatype of each array.
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Task 2: Array Indexing and Slicing

1. Create a NumPy array from the following list:
data = [10, 20, 30, 40, 50, 60, 70, 80, 90]
 2. Write a Python program to:
 - Retrieve the first three elements of the array.
 - Retrieve every alternate element of the array.
 - Reverse the array.
 3. Perform the above operations and display the results.
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Task 3: Mathematical Operations

1. Create two NumPy arrays, A and B, each with 5 random integers between 1 and 20.
 2. Write a Python program to:
 - Add, subtract, multiply, and divide the two arrays element-wise.
 - Compute the dot product of the arrays.
 - Find the mean, median, standard deviation, and variance of array A.
 - Identify the maximum and minimum values in array B and their indices.
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Task 4: Reshaping and Transposing

1. Create a 1D NumPy array of 12 integers ranging from 1 to 12.
 2. Write a Python program to:
 - Reshape the array into a 2D array of shape (4, 3).
 - Reshape the array into a 3D array of shape (2, 2, 3).
 - Transpose the reshaped 2D array and display its shape.
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Task 5: Boolean Masking and Filtering

1. Create a NumPy array with 15 random integers between 10 and 50.
 2. Write a Python program to:
 - Find all elements greater than 25.
 - Replace all elements less than 30 with 0.
 - Count the number of elements divisible by 5.
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Task 6: Working with Built-in Functions

1. Use NumPy's built-in functions to:
 - Create an array of 10 equally spaced values between 0 and 1.

- Create an identity matrix of size 4x4.
 - Generate a 1D array of 20 random integers between 1 and 100, sort it, and find the 5 largest elements.
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Task 7: Generic

1. Create a Python program that:
 - Generates two large random arrays of size (100, 100).
 - Performs matrix multiplication on the two arrays.
 - Finds the determinant and inverse of the resulting matrix (if possible).
 - Measures the time taken to complete these operations.
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