Sheet 1
Python Libraries - Numpy

Questions

1. How can you create a Numpy array? What is the shape of a Numpy array and how can you get it?
2. How can you perform element-wise operations on Numpy arrays (list the possible element-wise operations) ?
3. How to sum all elements of one array ?
4. How to transpose a Numpy array?
5. What transpose do to the Numpy array?
6. Having matrix_A and matrix_B both with shape (3,2) how to create a numpy array with shape (2,3,2) using np.concatenate?
7. What is the difference between reshape and resize in Numpy?
8. How can you extract the diagonal elements of a Numpy array?
9. What is the difference between np.dot and np.matmul in Numpy?
10. How can you perform element-wise comparison of two Numpy arrays (list the possible element-wise comparisons)?

Coding Questions

1. Create a 1-dimensional NumPy array of length 7 with random integers between 0 and 20. Insert the value 100 at the third index of the array. Then, delete the value at the fifth index of the array. Finally, calculate and print the minimum value and the unique values of the updated array.
2. Create a 2D numpy array with dimensions (3,4) and fill it with random integers between 1 and 10. Then, append a row of zeros at the end of the array, and reshape the array to (4,4). Finally, find the maximum value in the array.
3. Create a 2D numpy array with dimensions (4,5) and fill it with random integers between 1 and 100. Then, insert a column of ones at index 2, and delete the first row of the array. Finally, compute the mean of the remaining elements in the array.

4. Create a 3D numpy array of shape (2, 3, 4) filled with ones. Then, use the delete function to delete the second row of the second dimension. Print the resulting array.

5. Create a 3-dimensional numpy array with shape (2, 3, 4) and fill it with random numbers between 0 and 1. Then, reshape it into a 2-dimensional array with shape (6, 4).

Deliverable

- This sheet is to be solved **Individually**.
- You are required to submit a ZIP file named **ID_FirstName_LastName_sheet1.zip**, any other naming format will not be accepted and file will be discarded.
- Inside the ZIP file there should be the PDF file with solutions for the questions and the Downloaded Colab Notbook for the Coding questions
- Any copied sheets will be immediately zeroed and other penalties may be applied.

Good Luck