Practice Assignment

September 12, 2025

Instructions

Answer all questions using Python. Include your code, outputs, and it's for practice will not be graded.

Questions

1. **Array Creation and Attributes**
   Create 1D, 2D, and 3D NumPy arrays (choose your own values). For each array:

   (a) Print its `shape`, `ndim`, `dtype`, `size`, and the Python `type`.

   (a) An array of ones with shape $(10, 2)$.

   (b) An array of zeros with shape $(7, 2, 3)$.

2. **Random Arrays with Seeds**
   Set a random seed for reproducibility. Then:

   (a) Create an integer array of shape $(4, 6)$ with entries in $[0, 10)$.

   (b) Create a float array of shape $(4, 5)$ with values drawn uniformly from $[0, 1)$.

3. **Indexing and Slicing Practice**
   From a $(3, 7)$ random integer array with entries in $[1, 10)$, display:

   (a) The element at position $(0, 0)$.

   (b) The first two rows.

   Also return the sorted unique values of the array.

4. **Basic Matplotlib Multi-Plot**
   Let $x =$ `np.arange(10)` and choose a custom list y of length 10 (include at least one outlier). Produce a 2×2 subplot figure containing:

   (a) Scatter plot of (x, y).

   (b) Line plot of (x, y).

   (c) Histogram of y values.

   (d) Box plot of y values.

5. **Pandas Data Wrangling with Iris Dataset**
   Load the Iris dataset :

   (a) Display the first 5 rows of the dataset.

   (b) Report the unique values of the categorical column `species`.

   (c) Compute the mean, median, and standard deviation of `sepalLength`.

   (d) Compute group-wise mean of all numeric columns grouped by `species`.

   (e) Create a simple scatter plot of `sepalLength` vs. `sepalWidth`, colored by `species`.

   (f) Read the iris.csv file into a pandas DataFrame and plot its data points on a scatter plot, taking `sepalLength` as the x-axis and `petalLength` as the y-axis. Display the data points in different colors for each class of Species.