Applied Python Test

Question 1:

Write a NumPy program to calculate cumulative sum of the elements along a given axis, sum over rows for each of the 3 columns and sum over columns for each of the 2 rows of a given 3x3 array.

Sample output:
Original array:
[[1 2 3]
[4 5 6]]
Cumulative sum of the elements along a given axis:
[1 3 6 10 15 21]
Sum over rows for each of the 3 columns:
[[1 2 3]
[5 7 9]]
Sum over columns for each of the 2 rows:
[[1 3 6]
[4 9 15]]

Question 2:

Write a NumPy program which first create a 5x5 array with random values between 1 and 100 and then apply the below operations on it.

1. Swap the first and last rows of the array.
2. Replace the minimum value in the entire array with 0.
3. Subtract the mean of each row from each element of the row.

Question 3:

Using a given array make a different array as in below example

Given: array = [1,2,3]

result array -> [1 1 1 2 2 2 3 3 3]

• Internal repeating should be as length of the array.

Question 4:

Dataset:

https://drive.google.com/file/d/14_ryeFj282GwpI9ihA-iOumkRy7PFigV/view?usp=drive_link

Questions Based on above dataset:

Q1. How many cars belong to each condition category (New, Used, Like New)?

Q2. What is the average price of cars for each brand?

Q3. How many unique car models exist for each brand?

Q4. Which transmission type (Manual or Automatic) is the most common, and how many cars have this type?

Q5. What is the minimum and maximum mileage of cars that use Diesel fuel?

Q6. Calculate the average price of cars listed in each year from the dataset.

Q7. What is the average price difference between cars in "New" condition and "Used" condition?

Q8. Find the most expensive car for each brand and its price.

Q9. For each condition category (New, Used, Like New), calculate the average mileage. Which condition has the highest average mileage?

Q10. Plot the distribution of car prices. Is the distribution skewed?

Q11. Visualize the price distribution for cars categorized by their condition (New, Used, Like New).

Q12. Create a bar chart showing the count of cars for each brand.

Q13. Use a bar chart to compare the average car price across different fuel types.

Q14. Use a line plot to show the number of cars listed for sale each year.

Q15. Use a boxplot to compare the price distribution for cars with different transmission types.

Q16. Use a heatmap to show the correlation between numeric columns (Year, Engine Size, Mileage, Price).

Q17. Use a line plot to visualize the trend of average car prices over the years for each condition (New, Used, Like New).