

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:

Write a python program to replace multiples of 3 or 5 as 0 in the given array.

Input: arr=[1 2 3 4 5 6 7 9]

Expected Output: [1 2 0 4 0 0 7 0]

Questions 5:

Write a function which will accept 2 arguments.

First: A 1D numpy array arr

Second: An integer n {Please make sure $n \leq \text{len}(\text{arr})$ }

Output: The output should be the nth largest item out of the array.

Test Case:

Input: arr = (12,34,40,7,1,0) and n=3,

Output; 12

Test case:

Input: arr=(12,34,40,7,1,0) and n=1

Output: 40

Dataset:

https://drive.google.com/file/d/14_ryeFj282Gwpl9ihA-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. Find out which transmission type is associated with the lowest average mileage for each brand.
- 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 top 3 brands with the highest total revenue (sum of all car prices) and analyze their average engine sizes.
- Q9. For each condition category (New, Used, Like New), calculate the average mileage. Which condition has the highest average mileage?
- Q10. Compare the price difference between manual and automatic transmission for each year, and identify years where the difference is highest.