

# Python Programming Questions

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## 1. Basic Data Types and Operations:

Write a Python program that takes two numbers as input and performs the following operations:

- Addition
- Subtraction
- Multiplication
- Division

## 2. List Operations:

Create a list of 10 random integers. Write a program to:

- Sort the list in ascending and descending order.
- Find the minimum and maximum values in the list.
- Calculate the average of the list.

## 3. Dictionary Operations:

Create a dictionary with 5 key-value pairs where the keys are student names and the values are their marks. Write a program to:

- Display all student names.
- Display all marks.
- Find the student with the highest marks.

## 4. String Manipulation:

Write a program that takes a sentence as input and:

- Converts the sentence to uppercase.
- Counts the number of vowels in the sentence.
- Reverses the sentence.

## 5. Numpy Array Basics:

Create a 1D NumPy array with numbers from 1 to 10. Write a program to:

- Reshape the array into a 2x5 matrix.
- Find the mean, median, and standard deviation of the array.
- Select the elements at the even indices of the array.

## 6. DataFrame Creation:

Using Pandas, create a DataFrame with the following data:

```
'''
```

```
Name  Age  Salary
John  28   50000
Anna  32   62000
Peter 25   48000
```

```
'''
```

Write a program to:

- Display the first two rows of the DataFrame.
- Add a new column "Department" with values "HR", "IT", "Finance".
- Remove the "Age" column.

#### 7. Reading and Writing CSV Files:

Write a Python program to:

- Read data from a CSV file into a Pandas DataFrame.
- Display the first five rows of the DataFrame.
- Write the DataFrame to a new CSV file after modifying a column.

#### 8. Group By Operations:

Given the following DataFrame:

'''

Department	Employee	Salary
HR	John	50000
IT	Anna	62000
Finance	Peter	48000
HR	Mike	52000
IT	Linda	58000

'''

Write a program to:

- Group the data by the "Department" column.
- Calculate the average salary for each department.

#### 9. Date-Time Operations:

Write a program that:

- Creates a Pandas DataFrame with a column of dates in the format `YYYY-MM-DD`.
- Extracts the year, month, and day from each date.
- Calculates the difference between two dates.

#### 10. Handling Missing Data:

Create a DataFrame with some missing values. Write a program to:

- Identify the missing values.
- Fill the missing values with the mean of the respective column.
- Drop any rows that still contain missing values.