# *Python Programming*

**Problem sets**

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**Problem 1: Mathematical Operations in List**

Write a Python program that performs the following operations on a list:

- Take n numbers from the user as input and store them in a list.
- Find the sum and average of the numbers.

***Sample Input:***

```
Enter numbers: 5 10 5 20 10
```

***Sample Output:***

```
Sum: 35 and Average: 11.67
```

**Problem 2: Removing Duplicate from List**

Write a Python program that performs the following operations on a list:

- Take n numbers from the user as input and store them in a list.
- Remove any duplicate numbers from the list.

***Sample Input:***

```
Enter numbers: 5 10 5 20 10
```

***Sample Output:***

```
List after removing duplicates: [5, 10, 20]
```

**Problem 3: String operations**

Write a Python program that takes a string from the user and:

- Converts the string to lowercase.
- Counts and prints the number of vowels in the string.
- Reverses the string.

***Sample Input:***

```
Enter a String: This is Python
```

***Sample Output:***

```
Lowercase: this is python
Number of vowels: 3
Reversed string: nohtyp si siht
```

**Problem 4: Finding Prime Number**

Write a Python program that takes two numbers from the user and prints all the prime numbers between them.

***Sample Input:***

```
Enter the first number: 10
Enter the second number: 30
```

***Sample Output:***

```
Prime numbers between 10 and 30: 11 13 17 19 23 29
```

**Problem 5: Count Characters in a list**

Write a Python program that takes a string from the user and counts the number of uppercase letters, lowercase letters, digits, and special characters.

***Sample input:***

```
Enter a string: Hello@123
```

***Sample output:***

```
Uppercase letters: 1
Lowercase letters: 4
Digits: 3
Special characters: 1
```

**Problem 6: List Flattening**

Write a Python program that flattens a list of lists into a single list.

**Sample Input:**

```
Nested List: [[1, 2, 3], [4, 5], [6, 7, 8, 9]]
```

**Sample Output:**

```
Flattened List: [1, 2, 3, 4, 5, 6, 7, 8, 9]
```

**Problem 7: Find the second largest number in a list**

Write a Python program that takes a list of numbers and finds the second largest number in the list without using any built-in sorting functions.

***Sample input:***

```
Enter a list of numbers: [10, 20, 4, 45, 99]
```

***Sample Output:***

```
Second largest number: 45
```

**Problem 8: String Compression**

Write a Python program that compresses a string using counts of repeated characters. For example, the string aaabbcc would become a3b2c2.

***Sample Input:***

```
Enter a string: aaabbcc
```

***Sample Output:***

```
Compressed String: a3b2c2
```

**Problem 9: Count words in a string**

Write a Python program that takes a string as input and counts the number of words in it.

***Sample Input:***

```
Enter a string: Hello world, this is a Python program.
```

***Sample Output:***

```
Number of words: 7
```

**Problem 10: Finding Palindrome in a List**

Write a Python program that takes a list of strings and identifies which of them are palindromes. A palindrome is a string that reads the same forwards and backwards.

***Sample Input:***

```
strings = ["radar", "hello", "level", "world", "madam", "python"]
```

***Sample Output:***

```
Palindromes in the list: radar level madam
```

## Optional Problems:

### Problem 11: Find the lucky student:

Write a Python program that identifies "lucky students" based on their token number. A student is considered "lucky" if their token number is a prime number. The program should:

1. Take a list of student names, token numbers, and scores as input.
2. Check if each student's token number is a prime number.
3. Print the names and scores of the "lucky" students (those with prime-numbered tokens).

***Sample Input***

```
Enter number of students: 4
Enter the name, token number, and score of student 1: John, 23, 85
Enter the name, token number, and score of student 2: Sarah, 11, 92
Enter the name, token number, and score of student 3: Mike, 24, 78
Enter the name, token number, and score of student 4: Emma, 17, 90
```

***Sample Output:***

```
Lucky students (prime token numbers):
Name: John, Score: 85
Name: Sarah, Score: 92
Name: Emma, Score: 90
```

### Problem 12: Remove the puncutuation from a string (Optional)

Write a Python program that takes a string as input and removes all punctuation marks from it.

***Sample Input:***

```
Enter a string: Hello, World! How's it going?
```

***Sample Output:***

```
String without punctuation: Hello World Hows it going
```