

Assignment 2

Instructions: Complete the following 5 programs and submit your solutions by the deadline on Google Classroom. Make sure to test your code thoroughly and use proper indentation and comments.

Due: Friday, 21 March 2025

Total Marks: 50

Program 1: List Operations with Loops

Write a program that takes a list of numbers as input and performs the following tasks using loops:

1. Print all the **even numbers** from the list.
2. Calculate the **sum of all numbers** in the list.
3. Find the **maximum number** in the list.

Example Input: [10, 21, 4, 45, 66, 93]

Example Output:

```
Even Numbers: 10, 4, 66
Sum of Numbers: 239
Maximum Number: 93
```

Program 2: Tuple Element Check

Write a program that takes a tuple and a number as input. Check if the number exists in the tuple. If it does, print the index of the number in the tuple. If it doesn't, print a message saying the number is not found.

Example Input:

```
Tuple: (10, 20, 30, 40, 50)
Number: 30
```

Example Output: Number 30 found at index 2.

Program 3: Dictionary Operations

Write a program that creates a dictionary to store the **names of students** as keys and their **ages** as values. Perform the following tasks:

1. Add a new student to the dictionary.
2. Remove a student from the dictionary.
3. Check if a specific student exists in the dictionary.

Example Input:

```
Initial Dictionary: {"Ali": 20, "Ahmad": 22, "Sara": 19}
Add Student: "Zahra", 21
Remove Student: "Ahmad"
Check Student: "Sara"
```

Example Output:

```
Updated Dictionary: {'Ali': 20, 'Sara': 19, 'Zahra': 21}
Sara exists in the dictionary.
```

Program 4: Set Operations

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

1. **Union** of the two sets.
2. **Intersection** of the two sets.
3. **Difference** between the two sets.

Example Input:

```
Set 1: {1, 2, 3, 4}
Set 2: {3, 4, 5, 6}
```

Example Output:

```
Union: {1, 2, 3, 4, 5, 6}
Intersection: {3, 4}
Difference (Set1 - Set2): {1, 2}
```

Program 5: Conditional Statements with Lists

Write a program that takes a list of numbers as input and performs the following tasks using **conditional statements**:

1. Check if all numbers in the list are **positive**.
2. Check if any number in the list is **zero**.
3. Print appropriate messages based on the checks.

Example Input: [10, 20, 0, 45, -5]

Example Output:

```
Not all numbers are positive.
The list contains a zero.
```

Note:

1. Use proper **indentation** and **comments** in your code.
2. Test your programs with different inputs to ensure they work correctly.
3. Submit your solutions by the deadline.

Good luck!