

## **Homework Assignment: Lists and Tuples in Python**

### **Part 1: Theory Questions**

1. Define the following terms:

- List
- Tuple
- Indexing
- Mutability
- Immutability

2. Explain the difference between lists and tuples in Python. Provide examples of when you might use each data structure.

3. Describe how indexing works in lists and tuples. Provide examples to illustrate indexing in both data structures.

### **Part 2: Coding Problems**

4. Problem 1: List Manipulation

Write a Python program that demonstrates various operations on lists, including:

- Creating a list of integers.
- Appending new elements to the list.
- Removing elements from the list.
- Accessing and modifying elements at specific indices.
- Printing the final list.

5. Problem 2: Tuple Operations

Write a Python program that showcases the use of tuples by performing the following operations:

- Creating a tuple of strings.
- Accessing elements using indexing.
- Attempting to modify an element (which should result in an error due to immutability).
- Concatenating two tuples.
- Printing the final tuples.

6. Problem 3: List vs. Tuple

Write a short essay comparing and contrasting lists and tuples in Python. Discuss their similarities, differences, and situations where one might be preferred over the other.

#### Submission Guidelines:

- Write your answers to the theory questions in clear and concise sentences.
- For the coding problems, write Python code that follows proper syntax and includes comments to explain the logic where necessary.
- Submit your homework as a Python script (.py file) along with your answers to the theory questions.
- Make sure your code is properly formatted and easy to read.

Note: Feel free to refer to your class notes, the lesson materials, or online resources to help you complete the homework. Good luck!