Answer the following

1. **What is the difference between Single quoted string and double quoted string in python?**

Difference between Single-Quoted and Double-Quoted Strings in Python

- Both single quotes (') and double quotes (") can be used to define strings in Python and function the same way.
- **Difference**:
    - Use single quotes inside a string with double quotes: "He said, 'Hello!'"
    - Use double quotes inside a string with single quotes: 'He said, "Hello!"'
    - Triple quotes (''' or """) are used for multi-line strings.

2.What is the difference between immutable and mutable objects?

Difference between Immutable and Mutable Objects

- **Immutable Objects**:
    - Cannot be changed after creation.
    - Examples: int, float, str, tuple.
    - Modifications create a new object in memory.
    - **Use Case**: For fixed, unchangeable data to prevent accidental modification.
- **Mutable Objects**:
    - Can be changed after creation.
    - Examples: list, dict, set.
    - **Use Case**: For dynamic data structures where data needs to be modified.

3.What is the difference between list and tuple in python?

Difference between List and Tuple in Python

- **List**:
    - Mutable: Can be modified after creation.
    - Syntax: [1, 2, 3]
    - Slower due to additional overhead for mutability.
    - **Use Case**: When frequent modifications (add, remove, update) are needed.

- **Tuple**:
    - Immutable: Cannot be modified after creation.
    - Syntax: (1, 2, 3)
    - Faster due to immutability.
    - **Use Case**: For fixed collections of data (e.g., coordinates, constant configurations).

4.What are the difference between a set and list in terms of Functionality and use cases?

Difference between Set and List in Terms of Functionality and Use Cases

- **Set**:
    - Unordered, no duplicates.
    - Syntax: {1, 2, 3}
    - Supports operations like union, intersection, and difference.
    - **Use Case**: When uniqueness and membership testing are important.
- **List**:
    - Ordered, allows duplicates.
    - Syntax: [1, 2, 3]
    - Flexible for indexed access and manipulation.
    - **Use Case**: For ordered collections and sequential data processing.

5.How does a dictionary differ from a list in term of data storage and retrieval?

Difference between Dictionary and List in Terms of Data Storage and Retrieval

- **Dictionary**:
    - Stores data as key-value pairs.
    - Syntax: {'key1': 'value1', 'key2': 'value2'}
    - Keys must be unique and immutable.
    - Fast retrieval using keys (O(1) average time).
    - **Use Case**: When data needs to be accessed via identifiers (e.g., lookup tables).

- **List**:
    - Stores data as an ordered sequence.
    - Syntax: [value1, value2, value3]
    - Allows duplicates.
    - Retrieval requires indexing or iteration (O(n) average time for search).
    - **Use Case**: For ordered collections and sequential data.