

# **Java Comparison Tasks**

## **Task 1: List vs Vector**

- Thread Safety: Vector is synchronized and thread-safe. List (ArrayList) is not synchronized.
- Performance: ArrayList is faster because Vector adds synchronization overhead.
- Synchronization: Vector synchronizes all methods; ArrayList requires manual synchronization if needed.

## **Task 2: HashSet vs LinkedHashSet**

- Order of Elements: HashSet does not maintain order. LinkedHashSet preserves insertion order.
- Performance: HashSet is slightly faster. LinkedHashSet has a small overhead to maintain order.
- Use Cases: HashSet for speed, LinkedHashSet when you need predictable iteration order.

## **Task 3: String vs StringBuilder vs StringBuffer**

- Mutability: String is immutable. StringBuilder and StringBuffer are mutable.
- Thread Safety: StringBuilder is not thread-safe. StringBuffer is thread-safe (methods synchronized).
- Performance: StringBuilder is fastest. StringBuffer is slower due to synchronization.
- When to Use: String for unchanging values, StringBuilder for fast updates in single-threaded code, StringBuffer for multi-threaded updates.