Java Comparison Summary

Task 1: List vs Vector

Thread Safety:
• ArrayList (List) → Not synchronized
• Vector → Fully synchronized

Performance:
• ArrayList → Faster
• Vector → Slower due to synchronization

Synchronization:
• ArrayList → Needs manual sync via Collections.synchronizedList()
• Vector → Synchronized automatically

Use Cases:
• ArrayList → Best for modern applications
• Vector → Rare, legacy support only

Task 2: HashSet vs LinkedHashSet

Order of Elements:
• HashSet → No order maintained
• LinkedHashSet → Maintains insertion order

Performance:
• HashSet → Slightly faster
• LinkedHashSet → Slightly slower due to ordering

Use Cases:
• HashSet → When order doesn't matter
• LinkedHashSet → When insertion order is required

Task 3: String vs StringBuilder vs StringBuffer

Mutability:
• String → Immutable
• StringBuilder → Mutable
• StringBuffer → Mutable

Thread Safety:
• String → Safe (immutable)
• StringBuilder → Not thread■safe
• StringBuffer → Thread■safe (synchronized)

Performance:
• String → Slow for many modifications
• StringBuilder → Fastest
• StringBuffer → Slower due to synchronization

Use Cases:

- String → Constant text
- StringBuilder → Heavy modifications in single-thread
- StringBuffer → Modifications in multi-threaded environments