Merge Intervals

For this problem we need to merge overlapping intervals after sorting them by start time.

Key Idea:

1. Sort intervals by starting value.
2. Initialize merged array.
3. Iterate through intervals:
   - If merged is empty or current.start > merged.back().end, add interval to merged.
   - Else, update merged.back() end = max(merged.back().end, current.end).

Complexity:

- Time: $O(n \log n)$ (sorting dominates)
- Space: $O(n)$ for result (can be optimized to $O(1)$ if allowed to modify input)