

Merging Overlapping Intervals

Problem Statement

Given a collection of intervals, merge all overlapping intervals.

For example, given the intervals [1, 3], [2, 4], [5, 7], and [6, 8], the output should be [1, 4], [5, 8].

Approaches

1. **Sorting and Merging**:

- Sort the intervals based on the start time.
- Iterate through the sorted intervals and merge if they overlap.
- If no overlap, push the current interval to the result.

2. **Stack-Based Approach**:

- Use a stack to store intervals as you iterate.
- If the top of the stack overlaps with the current interval, merge them.

Edge Cases

1. **Intervals that don't overlap**: Ensure the result includes all intervals.
2. **Single interval**: Only one interval, return it as is.
3. **Multiple intervals with exact overlap**: Handle cases where intervals overlap completely.
4. **Intervals with no intersection**: Ensure they are returned separately.