Lab3 Ex1

February 9, 2026 11:37 am

2. The merge sort implementation has O(n log n) worst-case complexity because it recursively splits the array into halves (creating $\log_2 n$ recursive levels) and at each level, the merge() function processes all n elements once when combining sorted subarrays. Since there are $\log_2 n$ levels and each level performs O(n) work, the total computational cost is O($nlog\ n$). This is true regardless of the ordering of elements because the algorithm will always fully split and merge every subarray (meaning it is the worst-case, average-case, and best-case complexity for this implementation).
3.