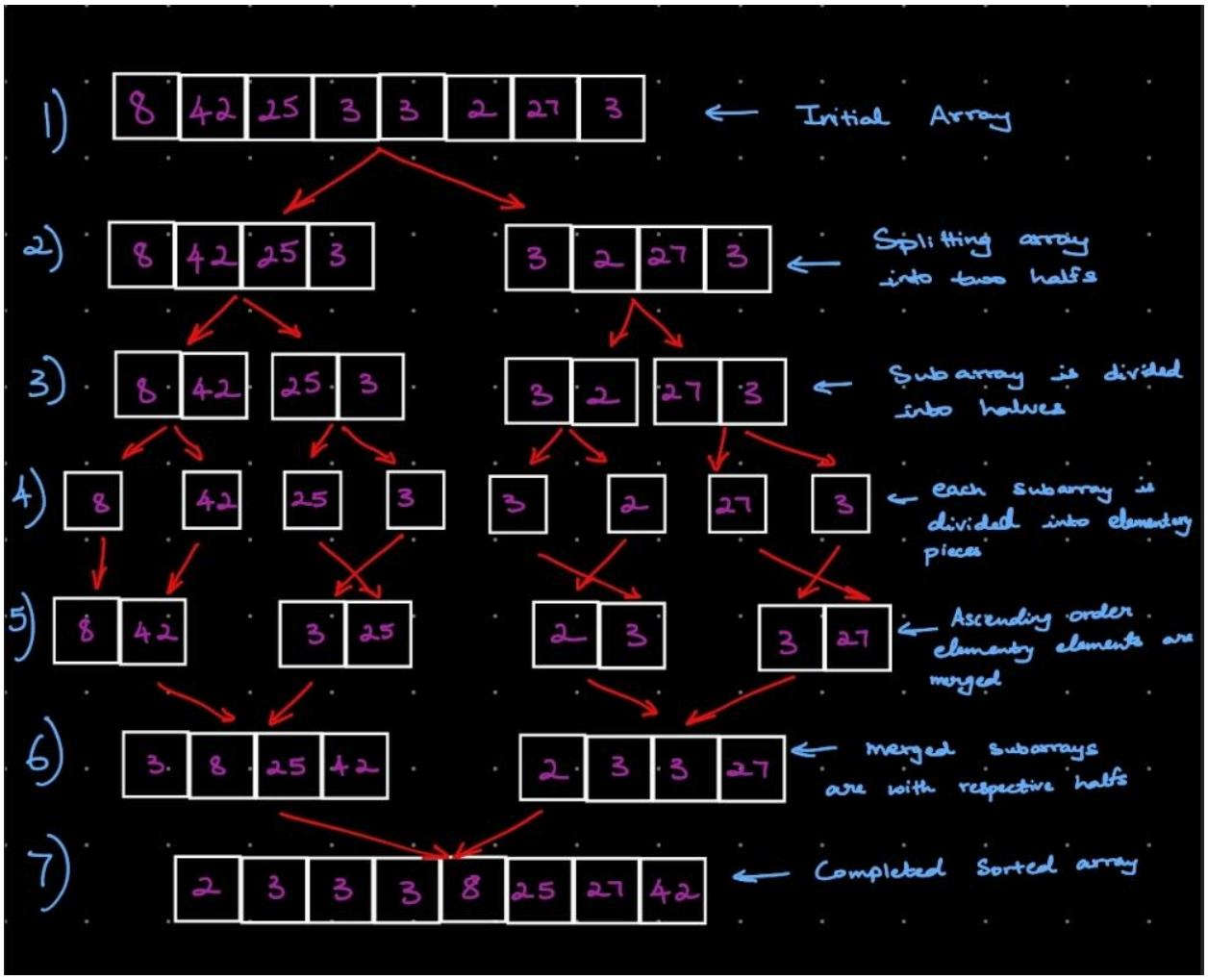
2. The merge sort algorithm implemented in the provided code has a worst-case complexity of O(n log n). The algorithm repetitively divides the array into halves, progressively reducing the problem size until individual elements are reached. The merge operation, which combines the divided arrays into a single sorted array, gets to run in linear time proportional to the size of the input array, leading to an overall time complexity of O(n log n).

3.



4. Yes, the number of steps in sorting the array aligns closely with the expected complexity analysis of O(n log n). With 8 elements in the array, the expected number of steps according to the formula 8 * log(8) is approximately 7.225. Hence, the observed number of steps is highly consistent with the anticipated complexity.