**Exercise 3: Sorting Customer Orders**

**Scenario:**

**You are tasked with sorting customer orders by their total price on an e-commerce platform. This helps in prioritizing high-value orders.**

* **Explain different sorting algorithms (Bubble Sort, Insertion Sort, Quick Sort, Merge Sort).**

**Bubble** **Sort** : It is a comparison-based sorting algorithm. It repeatedly steps through the list, compares adjacent elements, and swaps them if they are in the wrong order. This process continues until the list is sorted. The worst case time complexity for bubble sort is *O(n^2).*

**Insertion sort:** Insertion Sorts the final array one item at a time. It is less efficient on large lists than more advanced algorithms like Quick Sort or Merge Sort but is more efficient than Bubble Sort. The worst case time complexity for insertion sort is *O(n^2).*

**Quick sort:** Quick Sort is a divide-and-conquer algorithm. It works by selecting a 'pivot' element from the array and partitioning the other elements into two sub-arrays, according to whether they are less than or greater than the pivot. The worst case time complexity for the quick sort algorithm is *O(n^2).*

**Merge sort:** Merge Sort is a divide-and-conquer algorithm that splits the array into halves, recursively sorts each half, and then merges the sorted halves to produce a sorted array. The time complexity for merge sort is O(n log n).