**3. SORTING CUSTOMER ORDERS**

**Understanding Sorting Algorithms**

Sorting is crucial for organizing and prioritizing data. Common sorting algorithms include **Bubble Sort**, which repeatedly swaps adjacent elements; **Insertion Sort**, which builds a sorted list by inserting elements at the right position; **Quick Sort**, which uses divide-and-conquer with a pivot to partition the array; and **Merge Sort**, which divides the list into halves, sorts them, and merges them back. Each algorithm varies in performance and efficiency based on input size and data distribution.

**Analysis**

**Bubble Sort** has a time complexity of **O(n²)**, making it inefficient for large datasets. **Quick Sort**, on the other hand, has an average time complexity of **O(n log n)** and is much faster due to its divide-and-conquer approach. In most real-world applications, **Quick Sort** is preferred because it handles large inputs more efficiently and reduces the number of comparisons and swaps significantly compared to Bubble Sort.

**Output**

A screenshot of a computer program

AI-generated content may be incorrect.