Bubble Sort in C

Bubble Sort is a simple sorting algorithm that repeatedly iterates through a list, compares adjacent elements, and swaps them if they are in the wrong order. This process continues until the list is fully sorted.

Algorithm:

1. **Iterate through the list:**
    - Compare the first two elements.
    - If the first element is greater than the second, swap them.
2. **Repeat the process:**
    - Move to the next pair of adjacent elements.
    - Compare and swap if necessary.
3. **Continue until the end of the list.**
4. **Repeat steps 1-3 until no swaps are needed.**

C Implementation:

```
void bubbleSort(int arr[], int n) {
    for (int i = 0; i < n - 1; i++) {
        for (int j = 0; j < n - 1 - i; j++) {
            if (arr[j] > arr[j + 1]) {
                int temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
            }
        }
    }
}
```

Time Complexity:

- **Best Case:** O(n) (when the array is already sorted)
- **Average Case:** O(n^2)
- **Worst Case:** O(n^2)

Space Complexity: O(1)
Algorithm Type: Comaprison

Key Points:

- Bubble Sort is a simple but inefficient sorting algorithm for large datasets.
- It's often used for educational purposes or for small datasets.
- More efficient sorting algorithms like Merge Sort, Quick Sort, and Heap Sort are preferred for larger datasets.