Insertion Sort in C

Insertion Sort is a simple sorting algorithm that works similar to the way you sort playing cards. It iterates through an array, picks an element, compares it with the elements before it, and inserts it at its correct position.

Algorithm:

1. **Iterate through the list:**
    - Pick an element.
2. **Compare the picked element with the elements before it:**
    - Shift the greater elements one position forward.
3. **Insert the picked element at its correct position.**

Implementation:

```
void insertionSort(int arr[], int n)
{
      for (int i = 1; i < n; i++)
      {
            int key = arr[i];
            int j = i - 1;

            while (j >= 0 && arr[j] > key)
            {
                  arr[j + 1] = arr[j];
                  j = j - 1;
            }
            arr[j + 1] = key;
      }
}
```

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)

Key Points:

- Insertion Sort is efficient for small datasets or partially sorted arrays.
- It's generally less efficient than Merge Sort and Quick Sort for large datasets.
- It can be useful when elements are inserted one by one.