

Selection Sort Algorithm

Selection Sort is a straightforward comparison-based sorting algorithm. It operates by repeatedly selecting the smallest (or largest, depending on the desired sorting order) element from the unsorted section of the list and swapping it with the first unsorted element. This process continues until the entire list is sorted.

Explanation

1. **Initialize:** Begin with the first element of the array as the minimum.
2. **Find Minimum:** Traverse the unsorted portion of the array to identify the smallest element.
3. **Swap:** Exchange the smallest element found with the first element of the unsorted portion.
4. **Repeat:** Shift the boundary between the sorted and unsorted sections one element to the right and repeat the process until the entire array is sorted.

Pseudocode

```
method selectionSort(array)
```

```
  n = length(array)
```

```
  -----
```

```
    // Assume the minimum is the first unsorted element
```

```
    minIndex = i
```

```
    // Check the rest of the array for a smaller element
```

```
    -----
```

```
      -----
```

```
        minIndex = j
```

```
        // Swap the found minimum element with the first unsorted element
```

```
        -----
```

```
        swap(array[i], array[minIndex])
```

```
  return array
```

```
  loop j from i + 1 to n - 1
```

```
  if array[j] < array[minIndex]
```

```
  if minIndex != i
```

```
  loop i from 0 to n - 1
```