Monday 8th November 2021

Sorting Algorithms

Order of Sorting

When sorting data with a bubble sort, it can be sorted into two orders; descending (5,4,3,2,1) or ascending (1,2,3,4,5) order.

How a Bubble Sort works

Chart, scatter chart

Description automatically generated

Merge Sort

A Merge Sort breaks a list into each of its component parts, and then rebuilds it in the correct order.

Text

Description automatically generated with medium confidence

Efficiency - Searching

|  |  |  |
| --- | --- | --- |
|  | Linear Search | Binary Search |
| Best Case | Search term is at the start of the list | Search term is the first median item |
| Worst Case | Search term is at the end of the list | Search term is the last median item |
| Good for | Unsorted list  Short list  List that is not searched often | Long list  List which is searched often |
| Advantages | Simple algorithm | Breaks the list down into smaller parts  Executes quickly |
| Disadvantages | Brute force | List must already be sorted  Complex algorithm |

Efficiency - Searching

|  |  |  |
| --- | --- | --- |
|  | Bubble Sort | Merge Sort |
| Best Case | Already Sorted list – only one pass needed | Search term is the first median item |
| Worst Case | Reverse sorted list – one full pass needed for each item |  |
| Good for | List with fewer items | List with more items |
| Advantages | Simple algorithm  No extra storage needed for copies of data | Breaks the list down into smaller parts  Longer lists only add a small amount of extra execution time |
| Disadvantages | Brute force  Longer lists take much longer to sort | Uses additional memory for copies of the list  Data must be split, even in short lists  Complex algorithm |