CSE 204

Data Structures & Algorithms

A runtime comparison between Quick sort and Merge sort

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**Machine Configuration:**

Core i5 @2.5 GHz

8 GB Ram

64-bit operation system

**Used software:**

Codeblocks

<https://www.onlinegdb.com/online_c_compiler>

**Complexity:**For merge sort:

Best Case:O(nlogn)

Worst case:O(nlogn)

Average case:O(nlogn)

For quick sort:

Best case:O(nlogn)

Worst case:O(n^2)

Average Case:O(nlogn)

**Table:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Case | n = | 10 | 100 | 1000 | 10000 | 100000 | 1000000 |
| Sort |
| best | merge | 0.01067 | 0.04067 | 0.19367 | 2.43867 | 25.91633 | 418.326 |
| quick | 0.003 | 0.04333 | 3.9833 | 313.5563 | 32617.491 |  |
| worst | merge | 0.01067 | 0.03533 | 0.27433 | 2.628 | 25.914 | 413.701 |
| quick | 0.00333 | 0.027667 | 4.7963 | 226.6483 | 23652.8413 |  |
| average | merge | 0.01267 | 0.02433 | 0.334 | 4.055 | 48.879 | 457.572 |
| quick | 0.00267 | 0.014 | 0.168 | 2.103 | 26.3807 | 268.931 |

**Graph:**