Algorithm PA1 report

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Test case  Size (words) | Insertion sort | | Merge sort | | Heap sort | | Quick sort | |
| Time  (sec) | Memory  (KB) | Time  (sec) | Memory  (KB) | Time  (sec) | Memory  (KB) | Time  (sec) | Memory  (KB) |
| Case 1  1362 | 0.02 | 14108 | 0.016 | 14108 | 0.016 | 14108 | 0.016 | 14108 |
| Case 2  9216 | 0.32 | 15476 | 0.055 | 14856 | 0.057 | 14712 | 0.055 | 14712 |
| Case 3  82360 | 24.3 | 26504 | 0.418 | 20484 | 0.46 | 19840 | 0.415 | 19840 |
| Case 4  185462 | 227 | 44108 | 0.952 | 27256 | 1.088 | 25808 | 0.958 | 25808 |
| Case 5  187607 | 142 | 40092 | 0.943 | 27244 | 1.079 | 25780 | 0.951 | 25780 |
| Case 6  37555 | 4.36 | 19684 | 0.198 | 17220 | 0.207 | 16924 | 0.196 | 16924 |
| Case 7  140106 | 77 | 35728 | 0.726 | 26504 | 0.802 | 25408 | 0.712 | 25408 |

* It seems that case 4 is an exception. Both time and space cost by case 4 are greater than which of case 5 even though the size of case 5 is slightly greater than the size of case 4.

So the plot below would not contain case 4 but other 6 cases.

* The strings are not memorized additionally besides Algparser in merge sort, heap sort, quick sort.

But the efficiency of insertion sort is too awful, so the strings are memorized in insertion sort to avoid calling Algparser::Querystring() every time. So the space cost in insertion sort is greater than that of the other 3 sort algorithm.

Insertion sort

Merge sort

Heap sort

Quick sort