Hw Report

Hw 1

Ahmet Göktuğ SEVİNÇ

150140120

9.10.2017

Q1)

Fullsort	10k	100k
Merge	0.045s	0.482s
Insertion	0.411s	88.191s

Filtersort	10k	100k
Merge	0.038	0.399
Insertion	0.148	19.115

For 1M files, Fullsort with merge sorting is taking 5.203 secs and Filtersort with merge sorting is taking 4.074 secs. But insertion sort is taking too much time for both of the sorting methods. I could not wait for it.

Q2)

Merge sort's arithmetic upper bound is $O(n\log_2 n)$ and insertion sort's arithmetic upper bound is $O(n^2)$. Since n^2 growing much faster than $n\log_2 n$, merge sort algorithm is faster than insertion sort algorithm for large amount of data. For small amount of data that difference would be much smaller.

Q3)

SET and RARITY attributes are similar to TYPE attribute because they are like containers that contains lots of different cards inside them. But NAME attribute is different because every card has a different name.

Q4)

Stable algorithms preserve the relative orders of objects. Merge and insertion sort algorithms are stable algorithms. If full sort would use an unstable algorithm, orders of some elements that has same weights could be different from their orders in input file. For example consider these cards in input file;

1- Innervate Druid Basic Basic Spell 0

2- Innervate Druid Basic Basic Spell 0

The order of these cards in output file could have been;

2- Innervate Druid Basic Basic Spell 0

1- Innervate Druid Basic Basic Spell 0