CS 6301.002

Implementation of advanced data structures and algorithms

Long Project 4: Multi-dimensional Search

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Report

Implementation:

- Used three indexes, one for each attribute i.e. item id, price and description.
- Treemap is used as the index as it is based on red-black trees which are the fastest performing trees.

Problems faced:

- Implementing the samesame() with the least running time keeping into account that we do not have to do the same thing again and again like sorting an already sorted array

Design Decisions:

- We tried using TreeSet instead of the HashSet in the Treemap<Long, HashSet<Item>>. We did this because TreeSet is also based on red-black trees and it ensures ordering of the elements giving advantage in functions like findMinPrice(), findMaxPrice() and Range(). But we couldn't use it as the run time came out to be 2-3 seconds more than what came out with the HashSet. It is a possibility that the TreeSet can give better results on bigger data having more percentage of find operations.

Run times:

- 11 seconds for LP4-bad test case

References:

- StackOverflow
- Wikipedia