Question 2)

(E)

1]

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| --- | --- | --- |
| Filename | Average for hashQuestLog | Average for treeQuestLog |
| quests4.csv | 1.25 | 2.0 |
| quests16.csv | 1.125 | 4.0 |
| quests250.csv | 1.232 | 13.34 |
| quests1000.csv | 2.148 | 18.08 |
| quests100000.csv | 1.45367 | 30.8778 |

2] log(n)

3] n2 log(n)

4] To display all quests in alphabetical order, treeQuestLog will be more advisable since the toString() method of this version iterates through the tree in order and is much more efficient because we do not require to check for the keys stored in our treeQuestLog, while we do on hashQuestLog

5] For displaying the quest log in random order, we can just use the hash quest log without the sorting part in regular toString method. We do not have to search through the entire array as once we convert the key to index, we can just iterate through the linked list in that index, On the other hand if it were a tree, we might end up searching the entire tree if we end up with a degenerate tree.