GTU Department of Computer Engineering

CSE 222/505 - Spring 2022

Homework #06 Report

Şiyar Tarık Özcaner

20010400421

1. System requirements

In this assignment there is 2 questions to answer, first question asks for multiple implementation of a hashmap using different hashing techniques, last one is about sorting algorithms and time complexity analysis of them.

1. Class diagrams

* Is in the directory

1. Problem solutions approach

Q1:

Not solved

Q2:

First two sort is the standard definition of the sorts and the last one is given in the pdf so an approach is not exactly existent other than very basic recursive binary search method to find min and max element.

For time complexities

Merge:

T(n) = 2T(n/2) + θ(n)

θ**(nLogn)**

Quick:

T(n) = T(n) + T(n-1) + (n)

θ **(nLogn)**

New sort:

T(n) = 2T(n/2) + θ(1)

n \* 0(logn)

0(nlogn)

1. Test cases

Test are done according to the pdf which is to use 1000 randomly generated arrays for each problem size (small (size = 100), medium (size = 1000), and large (size = 10000))

1. Running command and results

After a simple “make” command in the terminal is enough and results are in parallel with the theoretical calculations.