CS 3310 - Data & File Structures
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Assignment 6 - Hashing

PHASE 1: SPECIFICATION

Create a hash function to encrypt the students' name, the input of the hash function should be one name, and the output should be an integer.

PHASE 2: DESIGN

The program is as broken down:

1. HashTable
    a. Main
    b. Menu runs the menu option for the user to select which function they want to operate
    c. Add - inserts names into the file and encrypts
    d. Search - searches based on name or hash number
    e. Delete - deletes based on name or hash number
    f. DisplayAll - currently displays what is in the hashTable file
    g. startTimer - starts timer for time analysis
    h. endTime = ends timer for time analysis and displays the processing time

PHASE 3: RISK ANALYSIS

Certain types of data can affect add, deletion, and searching functions

PHASE 4: VERIFICATION

I have verified that the methods and functions work as expected in the specs.

PHASE 5: CODING

Everything was coded in JAVA using the Eclipse IDE. Generics were used as requested which allows for many different data types to be added to the hash table.

PHASE 6: TESTING

I ran tests using my own name and others. I had my roommate also test my program to see how well it would work for a non-programmer.

Space complexity:
Insertion = O(1)
Searching = O(N)
Deletion = O(N)

Time complexity is listed in the program

PHASE 7: REFINING THE PROGRAM

Future refinements could be made to the program such as deleting and then displaying all somehow shows the names still in the file, but when exiting the program that shows the absolute correct output in the hash table.

PHASE 8: PRODUCTION

I prepared a copy of the entire program for Lab TA's evaluation, as specified by the TA. Then, I sent electronically the copy to the Lab TA using eLearning dropbox.

PHASE 9: MAINTENANCE

Based on the feedback received from the grader, I will perform maintenance as needed to my program.