CS2028C Homework 4

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Contributions

Nicholas McClorey defined the abstract HashTable class, implemented the LinearProbing class and wrote the unit tests. Daniel Wood worked on the main.cpp file and Kyle Van Blaricom worked on the DepthTable class.

Compiling

Our program can be compiled using MinGw on Windows 10. It can also be compiled using the TDM compiler. To compile the main program, open a terminal or command prompt, navigate to the directory with our source code and execute the command "g++ main.cpp LinearProbing.cpp DepthTable.cpp -std=c++11". To compile the unit tests, execute the command "g++ UnitTests.cpp LinearProbing.cpp DepthTable.cpp -std=c++11".

Analysis

Overall, the LinearProbing class created for task 1 worked better than the hash table with a 2d array. Due to its large size, there were few collisions. The first 50 items had no collisions, meaning the remove function worked efficiently. When adding more items, a few collisions occured. The Depth Table used a 2d array which wasn't as long so it experienced more collisions.

```
C:\Users\Nick\Documents\College_Classes\ds\git\hw4 (master -> origin)
λ g++ main.cpp depthTable.cpp LinearProbing.cpp -std=c++17

C:\Users\Nick\Documents\College_Classes\ds\git\hw4 (master -> origin)
λ a

running tests on Linear Probing
Spots checked after inserting 50 items: 50
Spots checked after removing 7 items: 7
Spots checked after inserting 50 more items: 55
Spots checked after finding 10 items: 11

running tests on Depth Table
Spots checked after inserting 50 items: 66
Spots checked after removing 7 items: 8
Spots checked after inserting 50 more items: 75
Spots checked after finding 10 items: 14

C:\Users\Nick\Documents\College_Classes\ds\git\hw4 (master -> origin)
λ |
```