Program Documentation

CIS22C Team 3 – Cupertino Restaurants

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Main:

Main contains the calls to invoke the program and its core routines that allow processing the data into the structure. Main loads the file to be processed, calls the routines to get the users inputs and saves the file on exit. Other functions in the file main.cpp are the utilities that allow the user to interact with the program. The program gets the users input and tests for validity. If the input is a valid command the input will be handed to a operations manager to launch a specific action. This process will continue until the user enters Q for quit. A menu will be presented to the user to allow (s)he to make one of several choices available to the program. The choices are insert data, delete data, search by street number or by restaurant name, list the data by hash sequence or by name sequence, print the indented BST, print the hash statistics, save the BST to file, quit and show the menu. Each of these choices has a manager defined within main except for the print and save options.

Hash: (Hash Array)

The purpose of the hash array is to store a pointer to an object (a restaurant) using a hash key as an index. The hash key is derived from the address number of the restaurant where each number is added to the subsequent number and then divided by 2.

Collision Table:

The collision table is a linked single linked list that is used to store pointers to objects (restaurants) when the hash of the address of the restaurant happens to have calculated to a node in the hash array that is occupied. The algorithm to test for a populated hash node determines if a list node in the collision table should be created and if so if it is a new list member or part of an existing list. The nodes are added to the collision table sequentially.

Binary Node:

The binary node is the primitive object of the binary search tree. The node has pointers for left and right children as well as a pointer to the object restaurant.

Binary Search Tree:

The binary search tree is a BST structure that provides methods for managing the binary search tree as well as maintaining the proper structure required to properly define the tree as a BST. The class has provisions for add / delete / insert / remove as well as print and save the tree to a file.

Restaurants:

A restaurant is the primary object of this application. A restaurant has attributes for the name, street number, street name and type and provides access for its data.

List Head:

The list head class manages the relationship between the two primary data structures (hash array and binary search tree) the list head also contains the count of the objects and the size of the hash array.