CS5343 Assignment 6

Cliff Eddings

Assignment 6 Description

Implement Hash table.
Pick 20 random words. Each word must be of different lengths, maximum length 8 and minimum length 3. The words will be
of letters a-z A-Z and the space character. Insert them into a hash table.
You can use a library for only the hash function.
The collision resolution scheme should be open addressing - quadratic.
Initially the table size is 31. The program should increase the table size and rehash at load factor of .5
At the end print the total number of collisions you get.
Submit your code.
Description of the program.

The program implements a Hash class of initial table size 31. The hash function uses the hash function for strings on page 16 of the lecture slides for Hashing. The program resizes and rehashes when the value of the load factor is greater than or equal to 0.5. Collisions are handled using quadratic probing.

Methods implemented in the program:

Private:

- get_size: returns the new size of the table, by doubling the table size then finding the next prime number
- increase_Table: increases the size of the table and rehashes the values.
- get_Key: hash function to get the key from a string by adding the values of the characters multiplied by their position in the word, then modulus by the table_size.
- get_load_factor: gets the load factor a double of the load counter / table_size
- check_load_factor: returns true if the load factor is less than 0.5, else returns false.

Public

- Hash: constructor that initializes a string array of table_size with empty cells.
- insert: inserts a string into the table
- insert_list: inserts an array of strings into the hash table.

The program initializes string arrays of words and runs the hash program on each. The hash program inserts the words in the hash table then ouputs the table and the number of collisions.

Compiling instructions.

This program was created using Microsoft Visual Studio. To compile open Visual Studio and create a new empty C++ project. Right click the source files folder under the solution explore window and click Add then Existing item. Browse to the file Source.cpp and double click. Save the project, click build, then “Local Windows Debugger.” The program should run.