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CS 5008 Lab 10: Hash tables

The purpose of this lab is to give you experience with implementing functions with hash tables.

Objectives

Upon completion of the laboratory exercise, you will be able to do the following:

- read an implementation of a hash table that uses open address linear probing
- implement the find operation for a hash table
- print the contents of a hash table

Part 1: Pull from class Github

Follow the procedure from prior labs to pull the starter code from Github to your local repository. You will find Lab10 folder that contains the pdf describing the lab and the starter code. These are the files for the starter code:

```
hash.h
hash.c
hash_main.c
```

Part 2: Understand the existing code

Open `hash.c`. In this lab, the hash table is implemented using open address linear probing. The keys are strings (`char *`).

1. What are the members of the `HT` struct? size, numItems, and table

2. What value is used to represent a `DELETE`d cell? DELETE

Read through the function definitions for `initTable` and `freeTable`. These produce the free the hash table structure, respectively.

Read through the function definition for `insert`.

3. What location is used for inserting the key? (circle answer)
   a. the hashed location (always) (includes linear probing)
   b. the location of the first null cell in the table
   c. the location of the first deleted cell in the table
   d. the location of the first null cell OR the first deleted cell in the table

Read the function definition for `delete`.

Now, read the code in `hash_main`. The main function creates a hash table, inserts items, finds items, and deletes items. Right now, the code is not completely working. It should compile, though: