COSC 3100 – Data Structures II

Assignment 4
Deadline September 25, 2023

1) Within the 'Stock' class, define the following member function:

   int hash(int size) const;
   Return an int value in the range 0..size-1. "size" represents the size of the hash table being used. *You can choose any way to define based on the Stock data members.*

2) Define a template structure 'HTElement' in which there are the following two members:

T item	the item being stored *(in this program this will be 'Stock')*
int status	0, 1, -1 *(based on the hash table process)*

3) Write a template class called 'HashTable' which implements a hash table using a dynamically allocated array, and the **quadratic probing method** to manage collision handling.

   Each element of the HashTable should be of type 'HTElement'.

   The HashTable class should have the following member functions:

   HashTable(int size = 10);
   Constructor to create a hash table of a specified size
   ~HashTable();
   Destructor to deallocate all elements of the hash table
   void remove(const T& item);
   Find the item and remove it
   void insert(const T& item);
   Insert a new item into the appropriate location in the hash table
   void display() const;
   Display all items in the hash table
   T* search(const T& item) const;
   Make a copy of object, if 'item' is found, and return a pointer to this copy. If 'item' is not found then return 'nullptr'.

4) Develop a 'main' function in which Stock objects are created and stored in the Hash Table, and clearly demonstrates that all of the member functions in the HashTable class work correctly.

THE DEPARTMENT STANDARDS FOR "STYLE GUIDELINES" SHOULD BE FOLLOWED IN ALL CODE.