CMPS 303 Data Structures. Home work #1

<hash tables for AlAhli emergency service>

This homework concerns the array, simple linked list, and hash table data structures that all have been covered during the course.

Description

The IT engineers at AlAhli hospital want to modify the structure of the hash table they are using to store the patient lists at the Emergency Service. They want to change from a hash table with linear probing to a hash table with separate chaining.

We will modify the classes and methods in files hash.java and hashChain.java (see lecture "cmps303-lecture 15-hashing" on blackboard) to help AlAhli engineers realizing their project. Please note that the patient information should at least include:
qatarID: a String, which plays the role of the key,
indate: a String representing the date of admission to the emergency service.

Questions:

1. Adapt the classes and methods of the two files hash.java and hashChain.java to take into account the patient information as specified above. Note that you may also need to change the names of some classes to avoid compiling and linkage conflicts (e.g. the hash table classes could be: simpleHashTable and chainHashTable).

2. In the main(), create one variable sht instance of simpleHashTable, fill the table with few patients and display its content.

3. Do the same as in step 2 for the class chainHashTable.

4. To allow the IT engineers to migrate their data from the old system to the new one, develop, hashCopy, a new private function of the class chainHashTable to be called by the constructor of this class to create an instance of chained hash table from an instance of simple hash table.

5. In the main(), declare a new variable cht2 instance of simpleHashTable, create the table from the sht table created in step 2 and display its content. Make sure that the outcome of this step is exactly the same as step 2.

6. Write another private function, name it resize(), of the class chainHashTable to be called by the insert function of this class when the load factor reaches 75%. The resize() function will double the size of the array.

7. Test the function resize() in the main().

Submission Deadline: The homework should be submitted through the blackboard **before** Sunday January 3, 2016. This is a firm deadline, passed this dates submissions will be blocked by the system. Submission should be done by groups of two students. The names and ID of the two participating students are to be added on the top of the java files. Email submissions are not acceptable and will not be considered.

Submission Format: Comment and organize your program to make it as clear as possible. Upload on the BB the directory of your eclipse project as one zip file. If needed add to your directory a readme text file to give any important information you need to communicate to me. Projects with compiling or linkage errors will be considered as incomplete and grade 0 will be given.