CSC520: Algorithms & Data Structures Fall 2016
Homework #5 (13 Points) Due: Tuesday, Nov. 22, 2016
External File Processing: Searching/Sorting/Hashing Dr. M. Owrang

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Part A): Searching/Sorting

Given the following internal Searching/Sorting Algorithms:

Searching:

- **Sequential Search**
- **Binary Search**
- **Hashing**

Sorting:

- **Bubble Sort**
- **Insertion Sort**
- **Selection Sort**
- **2 Way Merge Sort**
- **Quick Sort**
- **Heap Sort**
- **Radix Sort**

Consider a data file containing N records stored on an external storage device.

A1. For Searching, which one technique (if any from the above list) would you choose? Briefly explain why. If none, justify your answer.

A2. For Sorting, which one technique (if any from the above list) would you choose? Briefly explain why. If none, justify your answer.

Provide examples to clarify/elaborate your answers.

Part B): Hashing Programming

B1: Write a program (in programming language of your choice) to create a hash file for the CSC521 class (42 students- Use AU ID as the key). Each record contains: ID, Name, Major, Classification Status, GPA, etc.

Use division hashing function, using a prime #.
Use linear probing as well as quadratic probing as collision handling scheme.

Print the average probing in creating your hash file, for both linear and quadratic probing.

EXTRA: (1 point)
Use division hashing function, using a non-prime #.
Use linear probing as well as quadratic probing as collision handling scheme.

Print the average probing in creating your hash file, for both linear and quadratic probing.

B2: Considering your hash file created based on division hashing scheme and linear collision/overflow handling, provide a search record option (based on student's ID) to display student's record.
Provide appropriate error messages.