University of Washington

Department of Computer Science and Engineering

CSE 373

Problem Set 4

Due Fri., Oct. 30, 12:30pm

Reading: Read Ch. 5.

1. (4 points) Exercise 5.1. Note: In Part A, insert the items at the end of the list.
2. (2 points) Exercise 5.9, Parts A and B. Note: Background for this problem is provided in Exercise 5.8.
3. (4 points) List the primary disadvantages of the following techniques: open hashing, linear probing, quadratic probing, and double hashing. Hint: Each technique has one primary disadvantage which can be described in a sentence. If you are uncertain as to which is the primary disadvantage, feel free to list at most two.
4. (10 points) Implement the INSERT and FIND routines for a closed hash table meeting the following specifications:
   - A sample input for your hash table is provided on the course Web site.
   - The size of the hash table is 71.
   - Choose a good hash function and collision resolution mechanism.
   - Insure that a new element can always be inserted for the given input. Explain in a sentence how you can make this guarantee.
   - Avoid inserting duplicates into the hash table.
   - Avoid primary clustering.

   Please report the number of collisions you found and the exact positions that are filled when you are done inserting into your hash table. What is the maximal number of collisions, before an item is inserted? Also, turn in your well-documented code.