CpSc 8400: Design and Analysis of Algorithms

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Handout 11: Homework #5, Due Thursday 3/24/16

Spring 2016
TTh 12:30-1:45
McAdams 119

5-1. Batch Construction with Linear Probing. Please do problem 107 from the hashing chapter in the textbook draft.

5-2. Longest Repeating Subarray. Given an array $A[1 \ldots n]$ of integers, please compute the length of the longest subarray that occurs in multiple locations (possibly overlapping). For example, if $7, 3, 1, 5$ occurs at two locations in the array, then the longest repeating subarray would have length at least 4. Please using hashing in your solution, and not fancy string data structures like suffix arrays and suffix trees.

5-3. Finding Near Neighbors. Please do problem 113 from the hashing chapter in the textbook draft.

5-4. Randomized Incremental Construction for the Closest Pair Problem. Please build on your solution for problem 5-3 to develop a randomized incremental construction algorithm for finding the closest pair of points in a 2D set of n points. Your algorithm should run in $O(n)$ expected time.