Student Name: _____ J#: _____

CSC 323 Algorithm Design and Analysis, Spring 2017
Instructor: Dr. Natarajan Meghanathan

Quiz 5 (Take Home) **Total: 30 points**

Due: March 7, 2017 (1 PM, in-class). Quiz solutions submitted after 1 PM will not be accepted. Submit a printed hardcopy in class (with this quiz sheet as a cover page and your name and J# on the top of the sheet).

Note: Strictly, there should NOT be any copying. If the instructor finds that two or more quiz solutions involve some sort of copying, all the concerned students found to be involved in copying will get a zero.

Recall the problem of finding local minimum in an array. An element is a local minimum if it is less than the element to its immediate left as well as less than the element to its immediate right. That is, we say the element A[i] at index i is a local minimum only if A[i] < A[i-1] and A[i] < A[i+1]. In this sense, an array A[0...n-1] can possibly have local minimum only at index values 1, ..., n-2 and not at indexes 0 and n-1.

In class, we discussed the pre-requisites for an array to have at least one local minimum. Recall the pre-requisites, as listed below:

(1) The array should have at least 3 elements
(2) The first two elements of the array should be decreasing and the last two elements of the array should be increasing
(3) The array should have distinct elements

Q1 (15 pts): In the slides, I did not give a formal pseudo code to find a local minimum (given the above three pre-requisites). Provide a pseudo code to find a local minimum in the array. (Note that: it is sufficient to find just one local minimum in the array). Create an array of 10 distinct integers that also satisfies the other two pre-requisites as listed above and show the execution of your pseudo code of Q1 to find a local minimum.

Q2) (15 pts) Construct a hash table for the array assigned to you and determine the average number of comparisons for a successful search. Also, determine the maximum number of comparisons you would encounter for an unsuccessful search. Assume the hash function is H(K) = K mod 5.

Student # / Name	**Array**
Alexander Arrington	[39, 4, 31, 83, 26, 81, 54]
Jaylen Boykin	[7, 60, 0, 61, 92, 28, 54]
Jason Bruno	[21, 27, 61, 13, 57, 42, 80]
Elbert Buchanan	[58, 51, 25, 73, 56, 0, 68]
Daniel Epps	[63, 3, 81, 71, 50, 66, 91]
Jordan Hubbard	[10, 30, 97, 66, 44, 92, 7]
Kayla Johnson	[55, 74, 48, 58, 68, 18, 34]
Bria McCutcheon	[98, 4, 43, 22, 25, 6, 32]
Darren McGee	[65, 84, 25, 5, 10, 72, 75]
Justin McGuffee	[7, 17, 1, 60, 90, 68, 13]
Kayshaunna Williams	[56, 61, 50, 60, 84, 10, 30]
Michael Wilson	[12, 70, 79, 39, 81, 47, 17]