

Homework 2

August 29, 2016

08/29/2016

Due on Saturday September 11, 2016

Notes:

- Please zip the files into a single file named “homework2.zip” and upload it into the grading area.
 - I will use my own Java main method by importing the package into my Java class method to test your code. Please be sure that all the constructors and methods are working in your own main method i.e. design a wide testing main to be sure that everything is working fine.
1. (10 Pts) Please add an iterator inner class to the Linear List Array representation.
 - (a) Please call the inner class as IteratorArray
 2. (50 Pts) Please implement our interface of a Linear List using the Chain representation.
 - (a) You could use an inner class chain node for that.
 - (b) Please call the class as ChainLinearList and the java file as ChainLinearList.java
 - (c) Use “package LinearList” at the top of your class to generate the class in the correct sub-directories.
 3. (10 Pts) Please using the ideas from the class, you need to test the average time for each method, add and remove, over the Chain and Array representations using a suitable time and a suitable number of random integers.
 - (a) Give the class for testing the name AverageTimeChainArray.java
 - (b) Please put the results of your runs in a readme file with the name, AverageTimeChainArray.txt
 4. (40 Pts) Imagine that you have an array of array representation of a sparse matrix, please device a class for this type of matrices with the following elements and methods
 - (a) A data container in row-column representation
 - (b) add(i,j, Item value) to a value into the position (i,j) in the data container.

- (c) `get(i,j)` method to output the value at position (i,j) .
 - (d) `remove(i,j)` method that return the value at position (i,j) and set the value at position (i,j) to 0.
 - (e) `output()` method that will print the matrix.
- Call the class `SparseMatrix` and use the name “`Sparse.java`” for the java file.
 - Use “`package Matrix`” at the top of your class to generate the class in the correct sub-directories.