Al Alamein International University
Faculty of Computer Science and Engineering

CSE111 Data Structures

Assignment1

This is a group assignment; you can form a group of two. Submit your java files on MS Teams, make sure your write in every file, group members' IDs and names, and task allocation matrix.

Task1) [50 marks] Provide an ADT java class for 2d arrays named "My2D" that supports the following functionalities:

1) **[5 marks]** Objects construction supporting ragged arrays.
2) **[5 marks]** Populate data. // suggest a way to fill in arrays elements
3) **[5 marks]** Matrix Display. // display the array as a matrix
4) **[5 marks]** Delete Row. // physical delete
5) **[5 marks]** Delete Column. // physical delete
6) **[5 marks]** Delete item. // physical delete
7) **[5 marks]** Matrix Padding. // fill in array with 0s to reach to the required size
8) **[5 marks]** Matrices Addition. // add two matrices and if sizes are not matching do padding
9) **[5 marks]** Matrices Comparison. // return 1 if the matrices are identical, 0 otherwise.
10) **[5 marks]** Matrix Transpose.

Task2) [50 marks] Provide an ADT java class for circular double linked list named "MyCDLL" that supports the following functionalities:

1) **[5 marks]** List Construction.
2) **[5 marks]** Populate Data. // suggest a way to fill in list elements
3) **[5 marks]** Display List. // display the list from head to tail
4) **[10 marks]** Insert Node
5) **[10 marks]** Delete Node
6) **[5 marks]** Search for a value. // return 1 when found, 0 otherwise
7) **[5 marks]** Compare two lists // return 1 when identical, 0 otherwise
8) **[5 marks]** Append List // add one list at the end of another

Hints.

- Create the proper data members, methods signatures, and proper class interface.
- Use the clean code rules indicated in class. Use refactoring and follow OODP.
- Create the proper test cases that show that your code is working correctly for every method
- Use comments in your code