

**Assignment/Homework #4**  
**COP-3530, Spring 2016**  
**Instructor:** Dr. Antonio L. Bajuelos

**Rules & Instructions:**

- Due date: Tuesday, April/19/2016 at 1 p.m. (Eastern Time)
- This assignment has **2 problems**.
- The assignment/homework will be submitted **by email** to [abajuelo@fiu.edu](mailto:abajuelo@fiu.edu)
- Your submission must be a ZIP file (not RAR format). **Please name your submission as 4\_XXXXXXX.zip, where XXXXXXX is your seven digit Panther ID number**).
- Please include the following header for each Java program:

```
/******  
Purpose/Description: <a brief description of the program>  
Author's Panther ID: <your Panther ID number>  
Certification:  
    I hereby certify that this work is my own and none of it is the work of  
    any other person.  
*****/
```

- Please indicate in the **subject of your email message** the following information:  
**COP-3530, SECTION U01, ASSIGNMENT #4**
- Please make sure that you do not include any other personal information in your submission (besides the **Panther ID** in the name of the ZIP file and in the headers of your Java files as explained above). For example, no date of birth or name should be found in the document(s) you submit.
- Submissions turned in after the due date and/or which don't meet the established formatting rules will not be accepted.

**Problem #1:**

Implement (in **Java**) the **RadixSort** algorithm to sort an array of integers.

**public void radixSort(int arr[])**

*Note:* To store and process the bucket lists, use an **ArrayList** structure.

**Problem #2:**

(a) If we define **sparse graph** as graphs for which  $|E| \in O(|V|)$ , which implementation of **DFS** will have a better running time efficiency for such graphs, the one that uses the **adjacency matrix** or the one that uses the **adjacency linked lists** representation? Justify.

(b) We can model a maze by having a vertex for a starting point, a finishing point, dead ends, and all the points in the maze where more than one path can be taken and then connecting the vertices according to the paths.

(i) Construct such a graph for the following maze.



(ii) Which traversal, DFS or BFS, would you use if you found the solution in this maze? Justify.