CS2230: Data Structures
Homework 1

Total points = 20
Due September 5, 2016, **11:59 PM**

To submit the program, *zip* all documents into a single file. Submit your solution through ICON Dropbox. Be sure to change the name on the author tag to your **full name**. **Always save the proof of submission, otherwise we can't verify if you submitted your assignment.**

Problem 1 (10 points)

Write a method called `ifEqual` that takes as input an array of integers, and returns `TRUE` if there is at least one pair of integers that are equal to each other, and `FALSE` otherwise. For example, when the input array is `[51,30,56,-24,14,56]`, `ifEqual` should return true; whereas if the input array is `[51,30,56,-24,14,17,89,98]`, `ifEqual` should return false.

The given program (`Equality.java`) contains a dummy method called `ifEqual`, and your solution should fill out the body of the method. You must **SUBMIT** your version of `Equality.java` containing all necessary changes.

Problem 2. (10 points)

You are going to develop a simple airplane seat reservation system in this problem. Assume a small airplane with seat numbers show in the following pattern:

```
1 A B C D
2 A B C D
3 A B C D
4 A B C D
5 A B C D
6 A B C D
7 A B C D
8 A B C D
```

Notice that there are eight rows and four columns in this example. Assume an 'X' marks that the seat is already assigned. Thus, if seats 2C and 5A are already assigned, the representation should look like:

```
1 A B C D
2 A B X D
3 A B C D
4 A B C D
5 X B C D
6 A B C D
7 A B C D
8 A B C D
```

You are given an incomplete program (`AirplaneSeatReservation.java`) that uses a two-dimensional character array `seats`. Check the constructor method of the given program

carefully to understand how the array is initialized. Initially no seat is assigned. Your task is to implement the following methods:

A. `reserveSeat()`: This method takes an integer parameter `row` and a character parameter `col`. These two parameters represent a specific seat that corresponds to a specific slot in the two-dimensional array. The method simply puts the character `'X'` in the correct slot to mark the corresponding seat as taken. For example, if `row` is `2` and col is `'A'`, this method replaces the content of `seats[1][0]` by the character `'X'`. Remember that the index of the first element in an array is zero (not one).
B. `freeSeat()`: This method takes exactly the same parameters as the method `reserveSeat()`, but does just the opposite. It puts the character given by parameter `col` at the slot (in 2D array) that represents the seat specified by the parameters `row` and `col`. For example, if `row` is `2` and `col` is `'A'`, this method replaces the content of `seats[1][0]` by the character `'A'`.
C. `getNumberOfSeatsAvailable()`: Counts and returns the number of available (i.e. unassigned) seats. The method returns an integer.
D. `displaySeats()`: Displays seats in the format shown in output.

Desired output:

```
1 A B C D
2 A B C D
3 A B C D
4 A B C D
5 A B C D
6 A B C D
7 A B C D
8 A B C D
32
29
1 A B C D
2 A B X X
3 A B C D
4 A B C D
5 A B C D
6 A X C D
7 A B C D
8 A B C D
30
1 A B C D
2 A B C X
3 A B C D
4 A B C D
5 A B C D
6 A X C D
7 A B C D
8 A B C D
```

You must **SUBMIT** your version `AirplaneSeatReservation.java` of containing all necessary changes.