

CS0045 ALGORITHMS AND INFO STRUCTURES APPLICATIONS

Assignment 9 – Sorting and Combining Queues

Preparation (the whole project should be done in Netbeans or other IDE)

1. In Netbeans, create a new project **Assign9** with GroupID **CS0045Fall2021** so that you get a package called **cs0045fall2021.assign9** (see previous handouts for details)
2. Download the 3 files from Canvas and put them all into the **cs0045fall2021\assign9** folder within the **src** folder.
3. File-Open all 3 class files and add the line **package cs0045fall2021.assign9;** to the top of each of them. All 3 files should now be part of the Source Packages for the project.

Task

1. Create a new class within the project and add it to the package. The class should be called **SortAndCombine** and consist of a **main** that will do the following:
 - Create an **ArrayQueue<Integer>** and add a sequence of integers entered by the user.
 - Create a second **ArrayQueue<Integer>** and add a sequence of integers entered by the user.
 - Put the items from the first **ArrayQueue** into an array, putting each item into its correct place to make the array sorted (low to high).
 - Put the items from the second **ArrayQueue** into a second array, putting each item into its correct place to make the array sorted (low to high).
 - Enqueue all the items from the first array in order back into the first **ArrayQueue**.
 - Enqueue all the items from the second array in order back into the second **ArrayQueue**.
 - Combine the two queues into one sorted queue.
 - Print the combined queue by dequeuing all entries.

Possible Output:

```
Enter integers for the first queue.  
Enter integers separated by a space and hit Enter when done.  
4 1 2 -5 46 23 -2  
Now enter integers for the second queue.  
Enter integers separated by a space and hit Enter when done.  
4 8 2 3 10 2 -2 21  
Sorted combined queue is -5 -2 -2 1 2 2 2 3 4 4 8 10 21 23 46
```

2. When you have finished, run your program twice with the test data below and take screenshots(s).

Test Data 1	Test Data 2
Queue 1: -5 7 10 41 -5	Queue 1: 1 0 -3 1 7 2 11 15 0 -4 5 10
Queue 2: 9 8 10 8 7 -2 0 98 22	Queue 2: 10 9 8 7 6 5 4 3 2 1 0

Help

1. You must write all the steps from scratch using only the 5 methods in **ArrayQueue**. You cannot use Java Collections classes and methods.
2. Handle **EmptyQueueException** where necessary using **try/catch**.
3. To input the integers, one idea is to input the whole line as a **StringTokenizer** object and then separate it into **String** tokens and convert them to integers. See the Java API.

Turning In the Assignment

Zip up the whole project from the base folder and submit the zipped file and the screenshot(s). Due by the start of the next class.