

Lab Exercise 5: Design and Implementation of an application using Linear Data Structures [30 Marks]

SE2205a: Data Structures and Algorithms using Java – Fall 2023

Open Day: October 31, 2023; **Cut off time:** November 11, 2023, Saturday @11.55 pm

Note: According to the dates provided on the course-outline, this lab is supposed to be published on the 6th of November.

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A. Rationale and Background

In this lab Exercise, you need to demonstrate your understanding of linear data structure in designing an application where you can use all the available concrete classes in Java for Linear Data Structures.

B. Evaluation and Submission Instructions

Submit your Lab online by carrying out the following instructions:

1. Create a Project with the following name: *username_Lab5*
2. For this Exercise, you need to create a package called LA5Q.
3. For this lab question, use the static header and footer methods you created before and **modify it** as you see fit.
4. **Comments:** For this lab, you need to present your design ideas via comments. Besides, **writing short but clear comments for this Labs is mandatory. If the comments are missing, no credit will be awarded.**
5. Once the lab is completed, go to your Lab folder. Select the project folder (e.g. *username_Lab5*). Right-click to select 'Send to' 'Compressed zipped folder'. Make sure it has the same naming convention (e.g., *username_Lab4.zip*). Upload this file to OWL as your submission.
6. You will be graded on this lab Assignment based on the design ideas (presented via comments), and on the commented and running code.
7. This lab will be graded heavily on the comments through which you will clearly mention the rationale of choosing certain data structures in implementing the application.
8. Please note the deadline: Saturday/11/Nov. @11.55 pm, and it is a hard deadline.
9. If your code does not run, even for a very minor issue, you will be awarded a zero-grade. It is your responsibility to make sure that the submitted code is a working code. The TAs will NOT accept any review request if your code does not run. Thank you.
10. If you submit class-file by mistake, you will be awarded a zero-grade.

Question [30 Marks] [DE3, KB3, ET2]

Here you need to create a real-world application with linear data structures. Please note the following:

- You have the option to use all the linear data structures available to you in Java Collection Framework.
- You need to design an all-economy (No Business-class or First-class) 'Airplane boarding and disembarking Application' for the passengers.
- It is an open-ended problem, with the only constraint that you need to use linear data structures.
- Through your comments, you need to provide your rationale in choosing any specific-type linear data-structure for boarding and disembarking steps.

- The application must be user-friendly, and any user, having no programming background, should be able to use this application.