
Project Component
Course: Object Oriented Programming (CS F213)
24th March, 2024
Course IC : Prof. Anita Agrawal

Question: Railway Reservation System

Design and implement an application for a Railway Reservation System. The application should facilitate users to book or cancel a ticket.

Initially, there are 5 trains available with non-symmetric routes:

3 trains from Goa to Mumbai
1 train from Mumbai to Goa
1 train from Goa to Bangalore

A minimum of 10 fields should be defined, including fare, number of seats, train number, type of coach, etc. Passengers can book tickets online after logging into the system. The fare for tickets varies depending on the type of coach booked. Additionally, there are Special Service Categories with discounted rates for:

Students: 30%

Senior citizens: 40%

Military personnel: 50%

Disabled people: 55%

Users also have the option to cancel their bookings, with cancellation criteria to be determined appropriately.

A Tatkal booking option is available, open for 1 hour every morning, enabling a limited number of passengers to book tickets during this window. The system also displays the booking status (Confirmed/Waiting/RAC) for trains scheduled on that day.

These basic minimum features are essential, but to establish a comprehensive system, additional functionalities may need to be incorporated.

The entire system has to be designed using OOP concepts:

Minimum 6 classes are required to accommodate all the requirements specified in the design problem. Additionally, it should include the following:

- (I) Overloaded methods (minimum 2)
- (II) Overloaded constructors (minimum 2)
- (III) Vararg overloading (minimum 2)
- (IV) Nested classes (static or nonstatic, atleast 1, this is a part of I above)
- (V) Abstract class (minimum 1)
- (VI) Interface (minimum 1, it can be nested interface or single level or multiple inheritance)

- (VII) Hierarchical Inheritance (atleast 1)
- (VII) Multiple Inheritance (atleast 1, this should be in addition to VI above)
- (VIII) Wrappers
- (IX) Package
- (X) Exception handling (atleast two cases)
- (XI) I/O: File Handling, scanner class etc. (atleast one from each of these)
- (XII) Multithreading (by either Implementing the Runnable interface or extending the thread class)

These are the minimum requirements, but you have the freedom to incorporate a greater number of each as needed.

Note: The names of variables, methods and classes should be lexically rational and should be accompanied with their description in the comments alongside. It goes without saying that the code should be well indented and should compile and run error free. However, do remember that a non-running code is better than a plagiarized one, and hence the latter one will be penalised heavily if it exceeds 10-15% (may result in recession of this component).

Draw the UML diagram for the above system

Your submission folder should include:

- (1) Word doc which explains your project thoroughly along with the UML diagram.
 - (2) The actual UML diagram
 - (3) Code appended to the above word doc.
 - (4) .java files
 - (5) PPT
 - (6) Rubrics of the usage of all of the above (I to XIII) . Make a table and list the above components and mention how many have you used in each of the category.
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