JAVA MODULE PROJECT

AIR TRANSPORT SYSTEM

You are required to write a software solution for Air Transport System which allows administrators to manage various airports, planes, schedules, bookings and passengers.

The application has to be implemented using Java as the frontend. This application stores details of airports, planes, schedules, bookings and passengers.

This software needs to address the following requirements:

BUSINESS REQUIREMENTS:

The project is for administrators who use the system to perform the following operations.

The Administrator module should allow administrators perform:

- A. Login and authentication.
- B. Saving details of airports, planes, schedules, bookings and passengers.
- C. Viewing and deleting the details of airports, planes, schedules, bookings and passengers.
- D. Updating various details periodically.
- E. Search for the required details based on the id and key fields.
- F. New administrators to register.

USER STORIES:

US01: LOGIN

As an Administrator,

I want to login to the application; so that I can get access to the welcome screen and application menu.

The following conditions and validations are to be performed during login

- a) The login id will be a valid email address.

b) Password should be a combination of at least an uppercase alphabet, lowercase alphabets, a digit, and a special character.

c) The email id and password cannot be blank.

d) The account should get disabled for 30 minutes on three invalid login attempts.

e) Proper messages should be displayed in case of errors and exceptions.

ACCEPTANCE CRITERIA

Given that I am an administrator,

When I enter correct User Id with Password in the Login screen

Then I should be able access the application menu

And navigate the menu to view the required details

Given that I am an administrator,

When I enter incorrect User Id with Password in the Login screen

Then I should be able prompted for a maximum of three times to renter the credentials.

Given that I am an administrator,

When I enter incorrect User Id with Password in the Login screen consecutively for three times

Then my account should get disabled for 30 minutes.

US02: CREATING AIRPORTS, PLANES, SCHEDULES, BOOKINGS AND PASSENGERS

As an Administrator, I want to create airports, planes, schedules, bookings and passengers.

a) The airports, planes, schedules, bookings and passengers should be created with a unique id.

b) The id should be 5 characters in the format "CNNNN" where the first character is an alphabet and last 4 characters are running numbers

c) The id should be autogenerated.

d) The id once generated cannot be modified.

e) The required fields should be accepted and validated.

ACCEPTANCE CRITERIA

Given that I am an administrator,

When I select the option to "Create by clicking the appropriate buttons or links"

And enter the required details

Then I should be able to autogenerate the id

And I should be able to save airports, planes, schedules, bookings and passengers

US03: VIEWING AIRPORTS, PLANES, SCHEDULES, BOOKINGS AND PASSENGERS

As an Administrator, I want to view airports, planes, schedules, bookings and passengers.

ACCEPTANCE CRITERIA

Given that I am an administrator,

When I select the option to "View by clicking the appropriate buttons or links"

I should be able to view airports, planes, schedules, bookings and passengers

US04: SEARCHING AIRPORTS, PLANES, SCHEDULES, BOOKINGS AND PASSENGERS

As an Administrator, I want to search airports, planes, schedules, bookings and passengers.

ACCEPTANCE CRITERIA

Given that I am an administrator,

When I select the option to "Search by clicking the appropriate buttons or links"

And enter the id or key fields

I should be able to view airports, planes, schedules, bookings and passengers

US05: DELETING AIRPORTS, PLANES, SCHEDULES, BOOKINGS AND PASSENGERS

As an Administrator, I want to delete airports, planes, schedules, bookings and passengers.

ACCEPTANCE CRITERIA

Given that I am an administrator,

When I select the option to "Delete by clicking the appropriate buttons or links"

I should be able to delete airports, planes, schedules, bookings and passengers

US06: NEW ADMIN REGISTRATION

As a New Administrator, I should be able to register myself to keep track and work on the system.

The following conditions and validations are to be performed when the new admin is registered

a) An error message is displayed if the email id is already in use by some other user

b) An error message is displayed if all the details are not filled

c) An error message is displayed if the name contains numbers or special characters

d) Password should be a combination of at least an uppercase alphabet, lowercase alphabets, a digit, and a special character.

e) An error message is displayed if the password entered by the customer is not in the expected format

f)   An error message is displayed if the phone number is already in use by some other user

g)   The user should be able to login with his/her email and password

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ACCEPTANCE CRITERIA

Given that I am an administrator,

When I select the option to register a new admin

And enter all the required details

Then I should be able to save the register the administrator.

DATABASE DESIGN:

a)   Create the database ER Diagram and implement the database.

b)   Create required constraints, procedures and functions as relevant and applicable.

c)   The database should be well normalized.

d)   Recommended to have a minimum of 3 fields to a maximum of 10 fields in each table.

REQUIREMENTS:

a)   The Application should be implemented using Java and layered architecture.

b)   The backend to be used is MSSQL.

c)   Appropriate validations and exception handling should be performed in the relevant layers of the application.

d)   The relevant Design principles and practices should be applied.

e)   Perform Unit Testing.

f)   Write effective java code.

g)   Extensively use features from Java 8 and advanced features till Java 21 wherever applicable.

BEST PRACTICES

a)   Follow proper naming conventions and ensure code quality

b)   Create meaningful comments to explain the purpose of the class and behaviours.

c)   Use StringBuilder for concatenating large strings

d)   Enforce Compile-Time Type Checking using Generics

e)   Validate Parameter Preconditions

f)   Proper handling of NullPointerException and other relevant exceptions.

g) Perform validations across the different layers of the project

h) The code should have modularity.

i) The deleted records should be flagged as inactive or deleted, but not physically deleted in the database.

j) Validate Parameter Preconditions

k) The code should have modularity.

SUBMISSION REQUIREMENTS BACKEND:

A. Submit a single archive containing all the artefacts

B. The artefacts are

    a. Project Source Code,

    b. Presentation,

    c. Database Scripts and

    d. A word document containing the screenshots of the

        i. Relevant screenshots, if any.