COLLEGE OF TECHNOLOGY AND BUILT ENVIRONMENT (CTBE)

Airplane ticket Management System Java Application Project Report

TEAM MEMBERS NAME	ID
❖ Kidist Million	UGR/6836/17
❖ Lidetu Wendyifraw	UGR/4955/17
❖ Meaza Mamaye	UGR/5196/17
❖ Natnael Leake	UGR/0430/17
❖ Mussie Fayisa	UGR/2447/17
❖ Milki Alemu	UGR/6115/17

✧ **Section 3, SiTE**

Submitted to: Abel Tadesse
: Michael Sheleme

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✧ Introduction

The Airplane ticket Management System is a java-based console application developed using Object-Oriented Programming (OOP)principles.The system simulates basic airline ticket operations such as managing flights, booking tickets, and handling users. The goal of this project is to apply OOP concepts such as encapsulation, inheritance, polymorphism, abstraction, exception handling, and layered architecture in a real-world inspired system.

This project was developed collaboratively using GitHub for version control and Maven for project management and build automation.

✧ Project Objectives:

The main objectives of this project are:

- ❖ To design a structured and modular airplane ticket management system.
- ❖ To practice OOP design patterns and layered architecture.
- ❖ To implement repositories and services for business logic separation.
- ❖ To collaborate using GitHub in a team environment.
- ❖ To understand java working principles and apply it to real world phenomenon.

Steps followed during our project implementation:

1. Designing.

As we all know, before implementing the code and starting the real work, it is advisable and better to design the features of our application. For this reason, the first step we took toward this project work was making the basic designs for our Airplane ticket management System java application.

As our System is Airplane ticket management, there are some basic things that such a system has to contain inside it. Those things will surely be the features our app will contain. Those feature include:

❖ Passengers utility

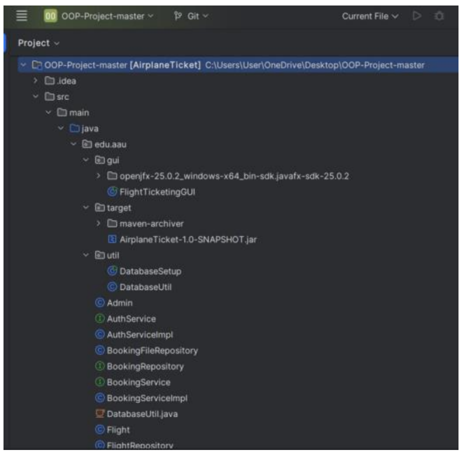
❖ Managers utility

❖ Booking a flight service

❖ Customer services during the flight

❖ Controlling booked flights and so on.

So we based our code implementation using the design we have created.



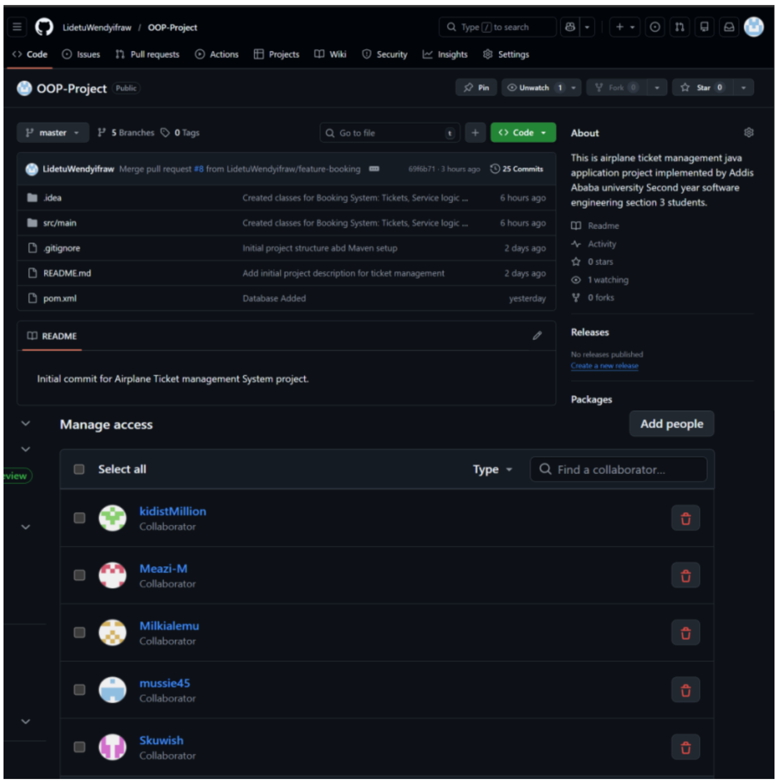
```
OO OOP-Project-master    Git    Current File
Project
⌄ OOP-Project-master [AirplaneTicket] C:\Users\User\OneDrive\Desktop\OOP-Project-master
  > .idea
  ⌄ src
    ⌄ main
      ⌄ java
        ⌄ edu.aau
          ⌄ gui
            > openjfx-25.0.2_windows-x64_bin-sdk.javafx-sdk-25.0.2
              FlightTicketingGUI
          ⌄ target
            > maven-archiver
              AirplaneTicket-1.0-SNAPSHOT.jar
          ⌄ util
              DatabaseSetup
              DatabaseUtil
            Admin
            AuthService
            AuthServiceImpl
            BookingFileRepository
            BookingRepository
            BookingService
            BookingServiceImpl
            DatabaseUtil.java
            Flight
            FlightRepository
```

The features labeled

as ndividual packages.

2. Creating a GitHub Repository.

We have created a GitHub repository to make the workflow smooth and to work collaboratively.



LidetuWendyifraw / OOP-Project

OOP-Project Public

master · 5 Branches · 0 Tags

LidetuWendyifraw Merge pull request #8 from LidetuWendyifraw/feature-booking · 69f6b71 · 3 hours ago · 25 Commits

.idea	Created classes for Booking System: Tickets, Service logic ...	6 hours ago
src/main	Created classes for Booking System: Tickets, Service logic ...	6 hours ago
.gitignore	Initial project structure abd Maven setup	2 days ago
README.md	Add initial project description for ticket management	2 days ago
pom.xml	Database Added	yesterday

README

Initial commit for Airplane Ticket management System project.

About

This is airplane ticket management java application project implemented by Addis Ababa university Second year software engineering section 3 students.

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Releases

No releases published
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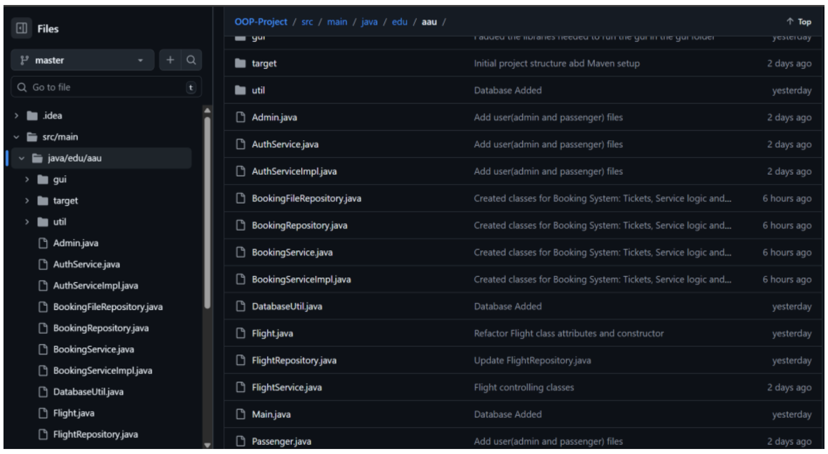
kidistMillion	Collaborator
Meazi-M	Collaborator
Milkialemu	Collaborator
mussie45	Collaborator
Skuwish	Collaborator

Git Repository

Collaborration



OOP-Project / src / main / java / edu / aau /

target	Initial project structure abd Maven setup	2 days ago
util	Database Added	yesterday
Admin.java	Add user(admin and passenger) files	2 days ago
AuthService.java	Add user(admin and passenger) files	2 days ago
AuthServiceImpl.java	Add user(admin and passenger) files	2 days ago
BookingFileRepository.java	Created classes for Booking System: Tickets, Service logic and...	6 hours ago
BookingRepository.java	Created classes for Booking System: Tickets, Service logic and...	6 hours ago
BookingService.java	Created classes for Booking System: Tickets, Service logic and...	6 hours ago
BookingServiceImpl.java	Created classes for Booking System: Tickets, Service logic and...	6 hours ago
DatabaseUtil.java	Database Added	yesterday
Flight.java	Refactor Flight class attributes and constructor	yesterday
FlightRepository.java	Update FlightRepository.java	yesterday
FlightService.java	Flight controlling classes	2 days ago
Main.java	Database Added	yesterday
Passenger.java	Add user(admin and passenger) files	2 days ago

Important classes for different features of the app started to be added.

Technologies and Tools Used

- ✧ **Programming Language: Java**

- ✧ **Development Environment: IntelliJ IDEA**

- ✧ **Build Tool: Maven**

- ✧ **Version Control: Git and GitHub**

- ✧ **Documentation Tool: Microsoft Word / PDF**

- ✧ **UML Tool: Draw.io / StarUML**

How we used and integrated data base to this project?

How we used it?

In this project, a database was used to store and manage flight and booking information permanently. Without a database, all data would be lost when the program is closed. By using a database, the system can save flights, bookings, and user information in a structured and persistent way.

The database helps to:

- Store flight details such as flight number, origin, destination, price, and available seats.
- Store booking records for passengers.
- Retrieve and search flight data efficiently.

How we integrated it?

The database was integrated with Java using **JDBC (Java Database Connectivity)**. JDBC is a Java API that allows Java programs to connect to and interact with databases.

In this project, the SQLite JDBC driver was added as a dependency using Maven. A database connection class was created to establish a connection between the Java application and the SQLite database. SQL queries such as INSERT, SELECT, UPDATE, and DELETE were executed using Java classes like Connection, Statement, and PreparedStatement.

The FlightRepository class uses JDBC to retrieve flight data from the database and convert database records into Java objects. Similarly, booking information is stored in the database using SQL insert queries.

This integration allows the Java application to persist data and ensures that the system behaves like a real-world airline ticketing system.

Conclusion

This project provided practical experience in designing and implementing an object-oriented system. The team learned how to structure Java projects, apply OOP principles, collaborate using GitHub, and document software using UML diagrams and reports. The Airplane Ticket Management System demonstrates a modular and scalable design that can be extended in the future.