FACULTY OF COMPUTING

SECJ3303-02 INTERNET PROGRAMMING

GROUP PROJECT - SECTION 06

PROJECT REPORT

Project Theme: Train Ticket Booking Management

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Prepared by:

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INTRODUCTION

The train ticket booking management System allows passengers to inquire about available trains based on their origin and destination, book and cancel tickets, check the status of a booked ticket, and so on. The goal of this project is to design and develop a website application development that keeps track of different trains, train status, and passengers. It is a computerized mechanism for reserving railway seats in advance. It is mostly utilized on lengthy routes. Online reservations have simplified the process of reserving seats more than ever before.

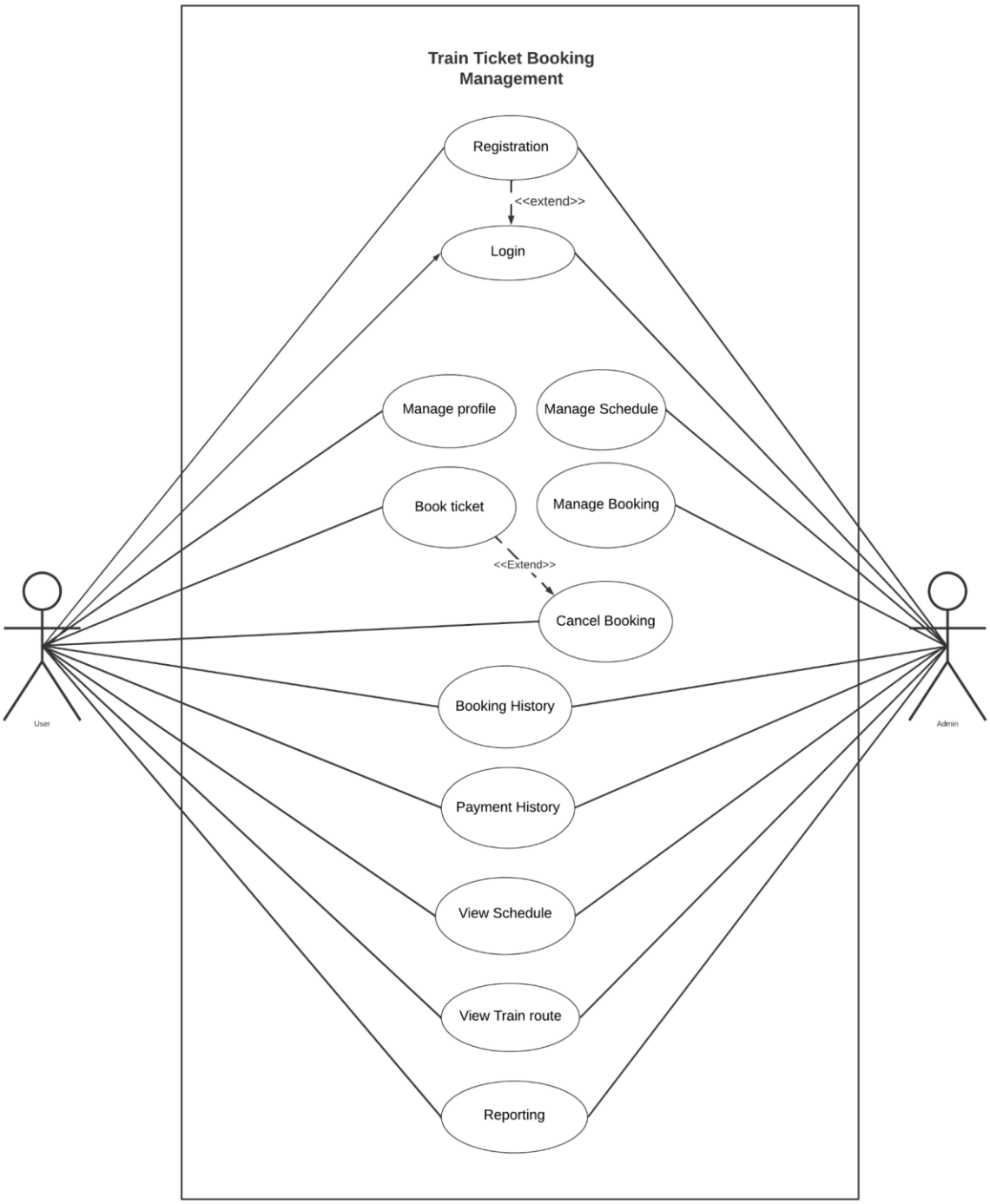
In certain countries, there are a lot of counters where one can simply make reservations and obtain tickets. The ticket booking system described above can result in an error-free, secure, dependable, and rapid management system. It might help the user focus on their other tasks rather than record keeping. As a result, it will assist organizations in making better use of their resources. The project administrator can input new train records, see all train records, change train records, and remove train records using a However, the user can book a ticket, manage their profile, cancel their booking and view their payment and booking histories. The train record provides its number, name, origin, destination, and the days on which it is available, whereas the train status record includes the dates for which tickets may be bought, the total number of seats available, and the number of seats already booked.

With this project, it would be feasible to reduce human errors in ticket booking and cancellation, as well as provide a web interface with enough UI and UX design to assist consumers in buying their tickets in a more simple manner. Hopefully, the system we create as a result of our plan will be a big success.

Module, Actor and Functionality

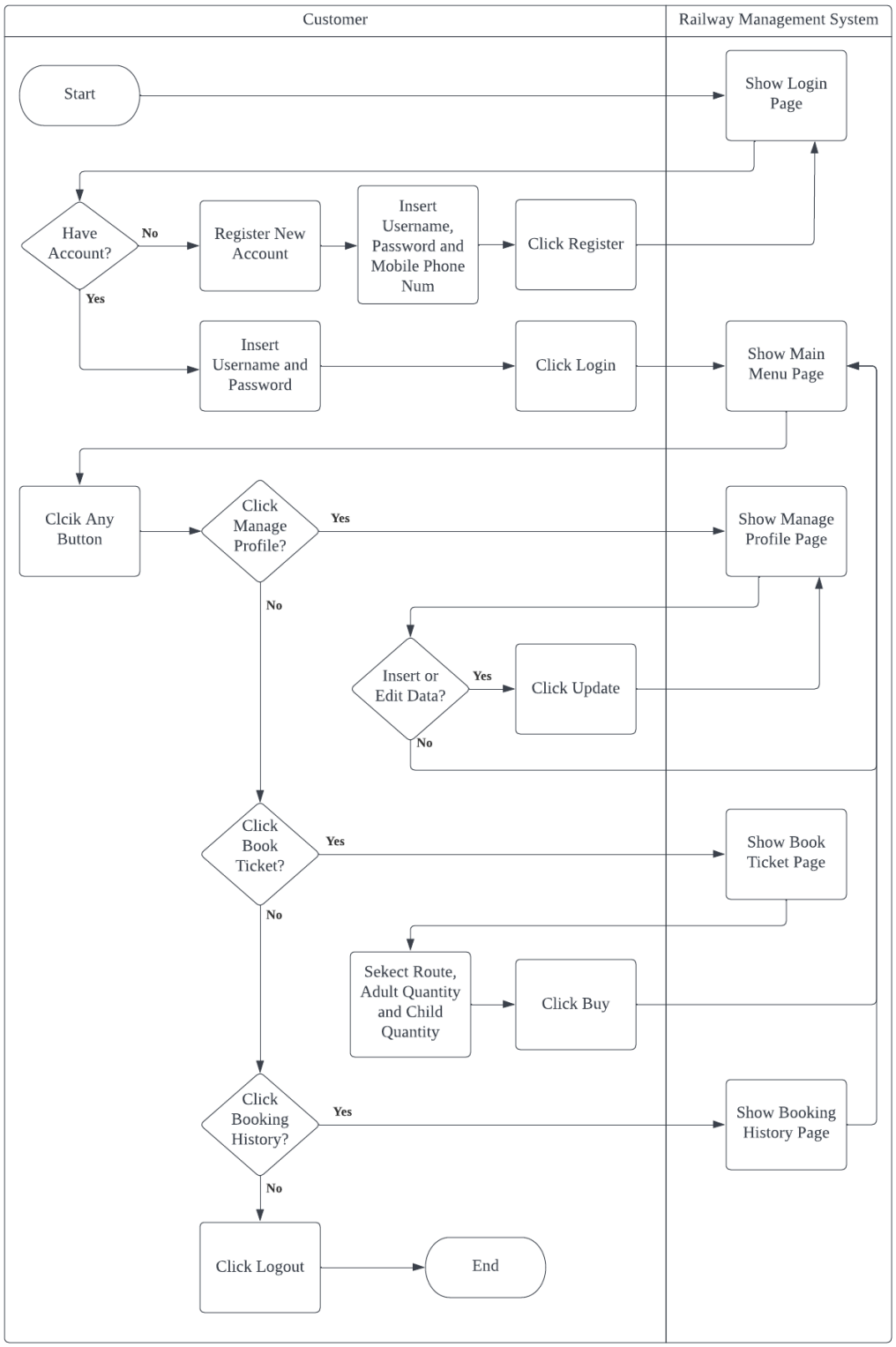
Module	Actor	Functionality
Login	Customer, Railway IT Officer	To use the website using the customer and officer own account
Manage Profile	Customer	To update any detail of customer in the account
Registration	Customer, Railway IT Officer	To create an account to use the website
Reporting	Customer, Railway IT Officer	To report any problem to the Railway IT Officer regarding the train, ticket and website
Book Ticket	Customer	To book a train ticket
Cancel Booking	Customer	To cancel a ticket that has been booked
View Booking History	Customer, Railway IT Officer	To view the history of previous booking ticket
View Payment History	Customer, Railway IT Officer	To view the history of previous payment done
View Train Route	Customer, Railway IT Officer	To view the route of the train
View Schedule	Customer, Railway IT Officer	To view and check the arrival time and destination place of the train
Manage Schedule	Railway IT Officer	To add a schedule or manage the arrival time in case of delay
Manage Booking	Railway IT Officer	To manage the customer’s booking in case of problem or error occurred

Use Case Diagram



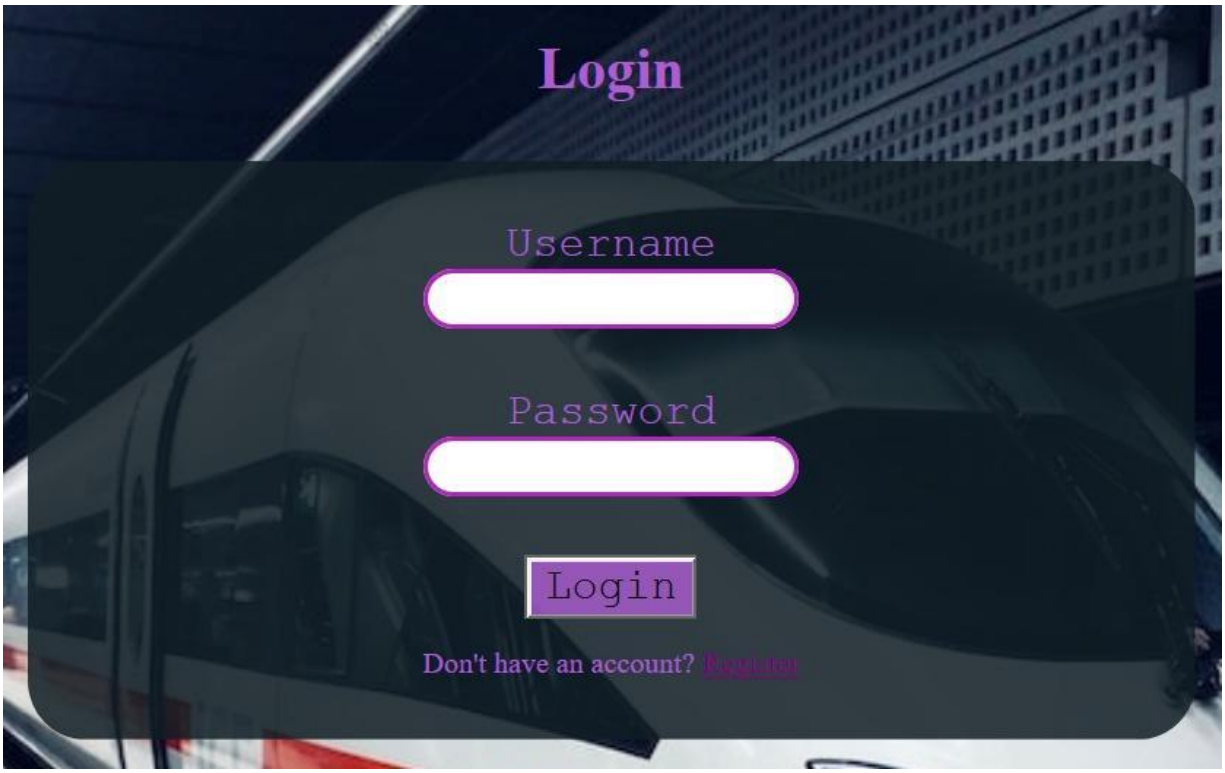
Flow of Project

Swimlane Diagram



Project demo (Code and Interface)

1. User Login

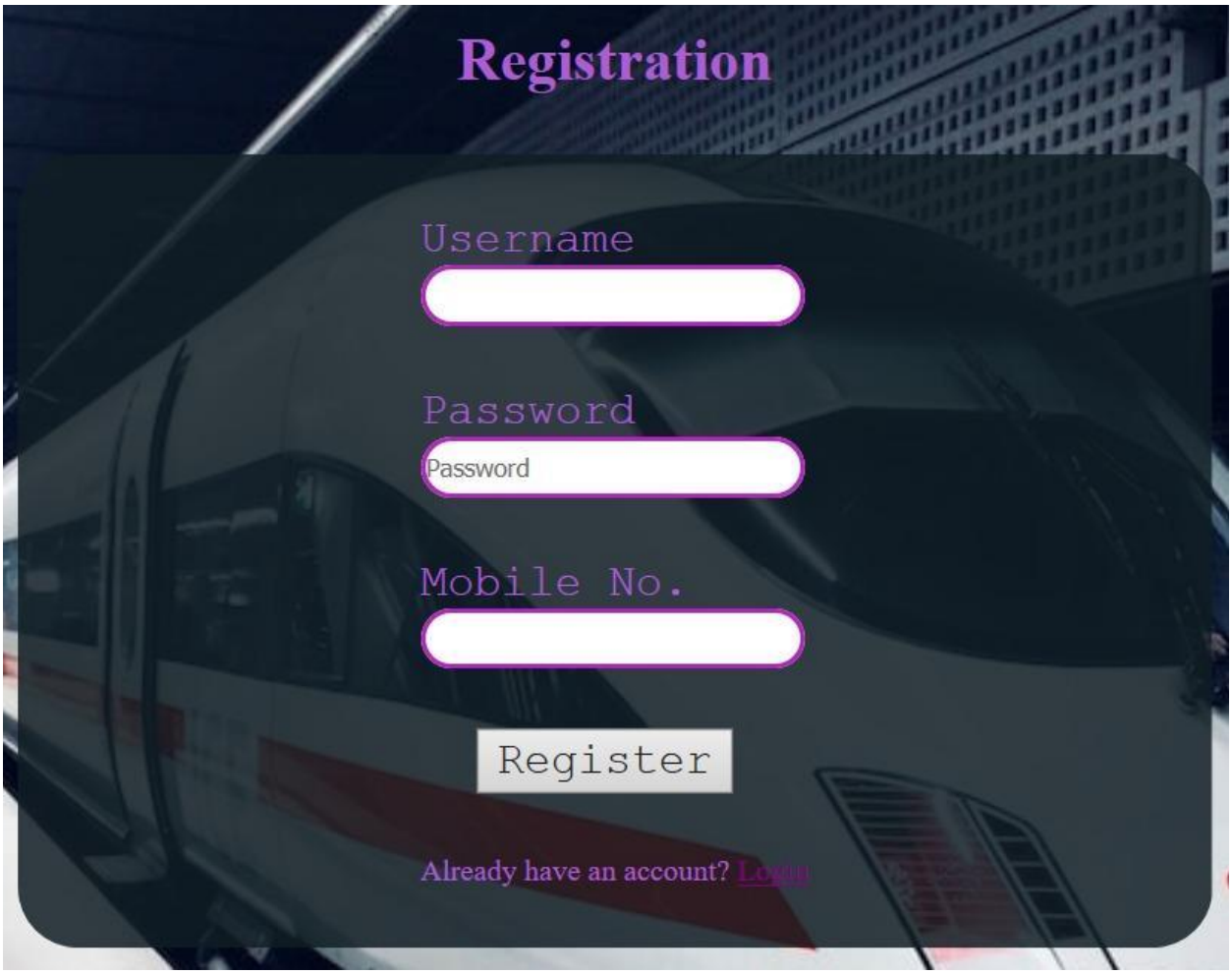


User Login Interface

```java
@RequestMapping("/home")
    public String login(HttpServletRequest request, Model mod) {
        HttpSession session = request.getSession();


        String username = request.getParameter("username");
        String password = request.getParameter("password");
        mod.addAttribute("username", username);


        String profilesTable = "SELECT * FROM profiles WHERE username = '" + username + "' AND password = '" + password
                + "'";


        Connection conn = dbUtil.openConnection();
        try {


            Statement sm = conn.createStatement();
            ResultSet profileRS = sm.executeQuery(profilesTable);


            if (profileRS.next()) {


                Profile profile = new Profile(profileRS.getInt("id"), profileRS.getInt("age"),
                        profileRS.getInt("phone"), profileRS.getString("username"), profileRS.getString("password"),
                        profileRS.getString("address"), profileRS.getString("dateofbirth"),
                        profileRS.getString("email"));


                session.setAttribute("profile", profile);
                mod.addAttribute("profile", profile);


                if (profileRS.isFirst()) {
                    String ticketsTable = "SELECT * FROM tickets WHERE profile_id = " + profileRS.getInt("id");
                    ResultSet ticketRS = sm.executeQuery(ticketsTable);


                    List<Ticket> ticketsList = new ArrayList<Ticket>();
                    while (ticketRS.next()) {


                        Ticket ticket = new Ticket(ticketRS.getInt("id"), ticketRS.getInt("profile_id"),
                                ticketRS.getString("route"), ticketRS.getInt("adult_qty"), ticketRS.getInt("child_qty"),
                                ticketRS.getDouble("price"), ticketRS.getString("booked_at"));


                        ticketsList.add(ticket);
                    }
                    mod.addAttribute("tickets", ticketsList);
                    session.setAttribute("tickets", ticketsList);
                }
                return "home-page";
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }
        return "error";
    }
```

Code for User LogIn

2. Registration

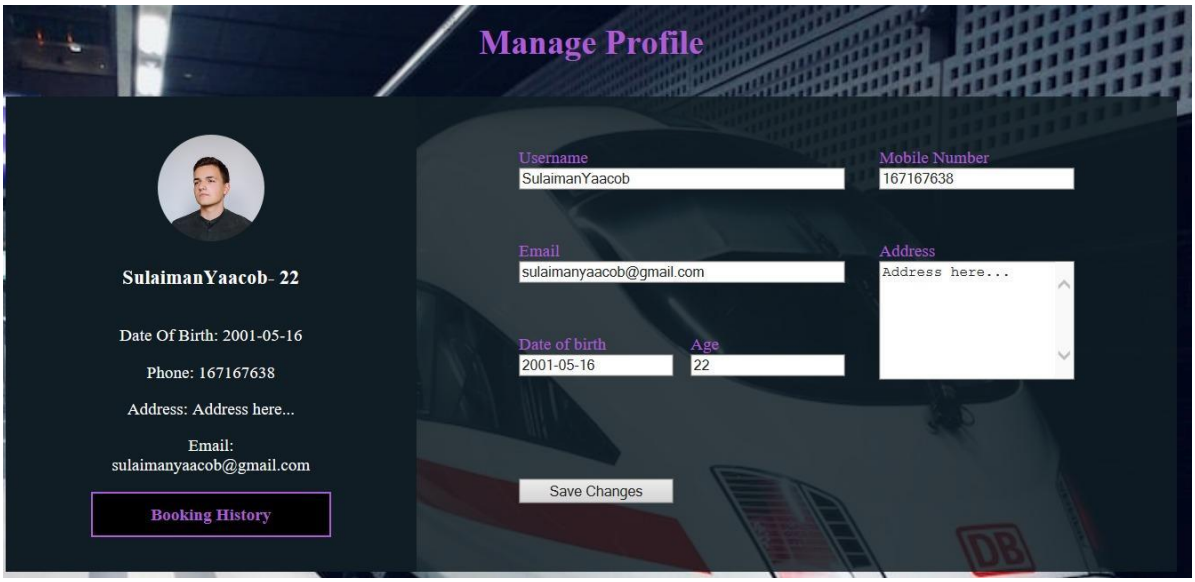


User Register / User SignUp Interface

```java
@ResponseBody
    @RequestMapping("/addProfile")
    public String register(HttpServletRequest request, Model mod) {


        String sql = "INSERT INTO `profiles`(`username`, `password`, `phone`) " + "VALUES (?,?,?)";


        int phone = Integer.parseInt(request.getParameter("phone"));
        String username = request.getParameter("username");
        String password = request.getParameter("password");


        Connection conn = dbUtil.openConnection();


        try {
            PreparedStatement ps = conn.prepareStatement(sql);
            ps.setString(1, username);
            ps.setString(2, password);
            ps.setInt(3, phone);


            int rowInserted = ps.executeUpdate();


            if (rowInserted > 0)
                System.out.println("Data is successfully inserted!");


        } catch (SQLException e) {
            e.printStackTrace();
        }


        return "User successfully created!";
    }
```

Code for User Register / User SignUp

3. Manage Profile

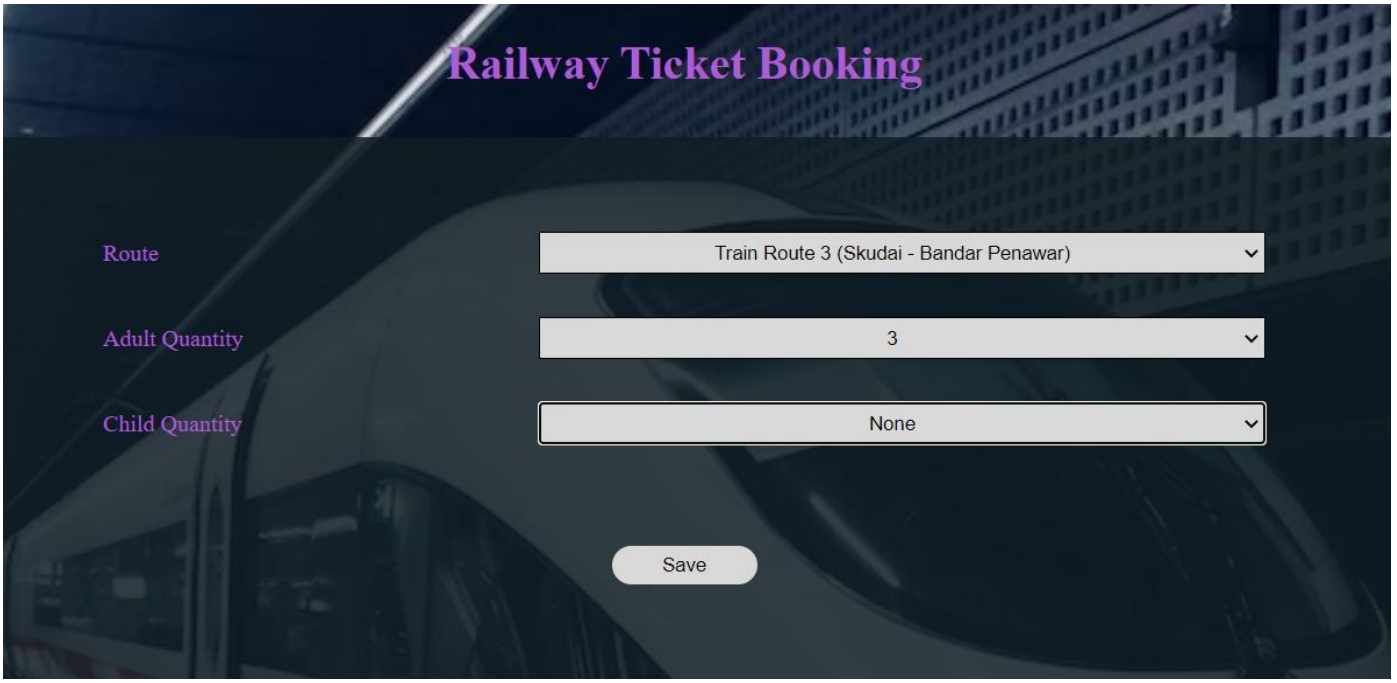


Interface for Manage profile (Edit / Update Profile)

```java
@ResponseBody
    @RequestMapping("/updateProfile")
    public String update(HttpServletRequest request, Model mod) {


        // retrieve id from parameter in ProfilePage.
        String username = request.getParameter("username");
        String address = request.getParameter("address");
        String email = request.getParameter("email");
        String dateofbirth = request.getParameter("dateofbirth");
        int age = Integer.parseInt(request.getParameter("age"));
        int phone = Integer.parseInt(request.getParameter("phone"));


        HttpSession session = request.getSession();
        Profile profile = (Profile) session.getAttribute("profile");
        profile.updateProfile(age, phone, username, address, dateofbirth, email);


        int id = profile.getId();
        String sql = "UPDATE `profiles` SET `username`=?, `phone`=?, `address`=?, `email`=?, `dateofbirth`=?, `age`=? WHERE `ID`="
                + id;


        Connection conn = dbUtil.openConnection();


        try {
            PreparedStatement ps = conn.prepareStatement(sql);
            ps.setString(1, username);
            ps.setInt(2, phone);
            ps.setString(3, address);
            ps.setString(4, email);
            ps.setString(5, dateofbirth);
            ps.setInt(6, age);


            int rowInserted = ps.executeUpdate();


            if (rowInserted > 0) {
                System.out.println("Data is successfully updated!");
                session.setAttribute("profile", profile);
                return "Profile Successfully Updated!";
            }


        } catch (SQLException e) {
            e.printStackTrace();
        }


        return "Error occured";
    }
```

Code for Manage profile (Edit / Update Profile)

4. Book Ticket



Interface for Ticket Booking

```
@ResponseBody
    @RequestMapping("/book")
    public String addBooking(HttpServletRequest request, Model mod) {


        String sql = "INSERT INTO `tickets`(`profile_id`,`route`, `adult_qty`, `child_qty`, `price`)"
                + "VALUES (?,?,?,?,?)";


        HttpSession session = request.getSession();
        Profile profile = (Profile) session.getAttribute("profile");
        String route = request.getParameter("route");
        int adult_qty = Integer.parseInt(request.getParameter("adult_qty"));
        int child_qty = Integer.parseInt(request.getParameter("child_qty"));


        double price = (adult_qty * 10) + (child_qty * 6);


        Connection conn = dbUtil.openConnection();


        try {
            PreparedStatement ps = conn.prepareStatement(sql);
            ps.setInt(1, profile.getId());
            ps.setString(2, route);
            ps.setInt(3, adult_qty);
            ps.setInt(4, child_qty);
            ps.setDouble(5, price);


            int rowInserted = ps.executeUpdate();


            if (rowInserted > 0)
                System.out.println("Data is successfully inserted!");


        } catch (SQLException e) {
            e.printStackTrace();
        }


        return "Ticket successfully booked!";
    }
```

Code for Ticket Booking

5. Booking History

Interface for Booking History

```java
@RequestMapping("/home")
    public String login(HttpServletRequest request, Model mod) {
        HttpSession session = request.getSession();


        String username = request.getParameter("username");
        String password = request.getParameter("password");
        mod.addAttribute("username", username);


        String profilesTable = "SELECT * FROM profiles WHERE username = '" + username + "' AND password = '" + password
                + "'";


        Connection conn = dbUtil.openConnection();
        try {


            Statement sm = conn.createStatement();
            ResultSet profileRS = sm.executeQuery(profilesTable);


            if (profileRS.next()) {


                Profile profile = new Profile(profileRS.getInt("id"), profileRS.getInt("age"),
                        profileRS.getInt("phone"), profileRS.getString("username"), profileRS.getString("password"),
                        profileRS.getString("address"), profileRS.getString("dateofbirth"),
                        profileRS.getString("email"));


                session.setAttribute("profile", profile);
                mod.addAttribute("profile", profile);


                if (profileRS.isFirst()) {
                    String ticketsTable = "SELECT * FROM tickets WHERE profile_id = " + profileRS.getInt("id");
                    ResultSet ticketRS = sm.executeQuery(ticketsTable);


                    List<Ticket> ticketsList = new ArrayList<Ticket>();
                    while (ticketRS.next()) {


                        Ticket ticket = new Ticket(ticketRS.getInt("id"), ticketRS.getInt("profile_id"),
                                ticketRS.getString("route"), ticketRS.getInt("adult_qty"), ticketRS.getInt("child_qty"),
                                ticketRS.getDouble("price"), ticketRS.getString("booked_at"));


                        ticketsList.add(ticket);
                    }
                    mod.addAttribute("tickets", ticketsList);
                    session.setAttribute("tickets", ticketsList);
                }
                return "home-page";
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }
        return "error";
    }
```

Code for Booking History

6. DataBase

Main Database

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	**id**	int(11)			No	*None*		AUTO_INCREMENT	Change Drop More
☐	2	**username**	text	utf8mb4_general_ci		No	*None*			Change Drop More
☐	3	**password**	text	utf8mb4_general_ci		No	*None*			Change Drop More
☐	4	**phone**	int(11)			No	*None*			Change Drop More
☐	5	**address**	text	utf8mb4_general_ci		Yes	*NULL*			Change Drop More
☐	6	**email**	text	utf8mb4_general_ci		Yes	*NULL*			Change Drop More
☐	7	**dateofbirth**	text	utf8mb4_general_ci		Yes	*NULL*			Change Drop More
☐	8	**age**	int(11)			Yes	*NULL*			Change Drop More

Structure for Profile Table

	id	username	password	phone	address	email	dateofbirth	age
Click the drop-down arrow to toggle column's visibility.								
elete	2	abc	123	123123123	testtest	qwerty@gmail.com	2023-01-17	23
☐ Edit Copy Delete	3	login	abcdefg	12334231	*NULL*	*NULL*	*NULL*	*NULL*
☐ Edit Copy Delete	7	Rizwan	123	167167638				0
☐ Edit Copy Delete	8	qwerty	321	321	*NULL*	*NULL*	*NULL*	*NULL*
☐ Edit Copy Delete	9	SulaimanYaacob	123	167167638	Address here...	sulaimanyaacob@gmail.com	2001-05-16	22

Data for Profile Table

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	**id**	int(11)			No	*None*		AUTO_INCREMENT	Change Drop More
☐	2	**profile_id**	int(11)			No	*None*			Change Drop More
☐	3	**route**	text	utf8mb4_general_ci		No	*None*			Change Drop More
☐	4	**adult_qty**	int(11)			No	*None*			Change Drop More
☐	5	**child_qty**	int(11)			No	*None*			Change Drop More
☐	6	**price**	double			No	*None*			Change Drop More
☐	7	**booked_at**	text	utf8mb4_general_ci		No	current_timestamp()			Change Drop More

Structure for Ticket Table

←T→		id	profile_id	route	adult_qty	child_qty	price	booked_at
☐	Edit Copy Delete	9	2	Train Route 1 (Johor Bahru - Iskandar Puteri)	4	3	58	0000-00-00
☐	Edit Copy Delete	10	2	Train Route 3 (Skudai - Bandar Penawar)	3	4	54	2023-01-28 11:44:05
☐	Edit Copy Delete	11	4	Train Route 1 (Johor Bahru - Iskandar Puteri)	3	3	48	2023-01-28 12:02:33
☐	Edit Copy Delete	12	9	Train Route 2 (Skudai - Panti Mountain)	2	1	26	2023-01-28 14:45:15
☐	Edit Copy Delete	13	9	Train Route 1 (Johor Bahru - Iskandar Puteri)	3	2	42	2023-01-28 14:46:17
☐	Edit Copy Delete	14	9	Train Route 3 (Skudai - Bandar Penawar)	3	0	30	2023-01-28 17:45:10

Data for Ticket Table

Reflection

Suleman Yacoob

Since this project is team-based and necessitates collaboration with other team members to construct a web application, my team-working and communication skills are further developed throughout. In addition, this project gives me the chance to use the skills I've acquired while studying internet programming to solve problems in the real world. Additionally, this hands-on learning has improved my comprehension of the lecture-taught material. Now I believe I have quite enhanced skills in running Spring tools, MVC architecture, JavaBean, JSTL, JDBC, session and cookies and so on. Moreover, my ability to lead and collaborate in groups during group discussions have also developed.

In terms of my contribution to the project, I helped in proposing solutions to the problems stated. Then I worked on the “Manage Profile (included Edit/ Update)”, “View Booking History” for this module by designing their interfaces and developing the Frontend and BackEnd; I also connected the database for the system and also looked over all other members’ works and provided support and modification wherever required. My Fellow team member, ***Rezwan****, is in charge of View Train route and Manage Schedule, he also did the swimlane diagram and helped me with the Database. Other than him,* ***Mir Tamzid*** *is in charge of "LogIn" and "View Payment History," whereas* ***Ruzhan and Ebrahim*** *are in charge for “Registration”, “View Schedule” and “Book Ticket”, “Manage Booking” respectively.*

In the group's assessment, I would state that even though we encountered some challenges during the development process, the web application development activity is proceeding without any major hiccups. However, because of our team's dedication and perseverance, we were able to overcome every challenge. In addition, each team member has demonstrated great responsibility for this project by successfully completing their specific jobs with high quality and on schedule. And since every single functionality of the application is capable of achieving the required functionality in the proposal, the outcome of the application development after integration is satisfying. Simply put, I am quite pleased with the web application we have created and I value the contributions made by each team member.

Mir Tamzid Hasan

After completing this project, I believe that my abilities in teamwork, communication, and software development have all improved. By addressing issues from the actual world, I'm learning how to create web applications. In addition, working on a real-world project has helped me better comprehend the concepts covered in these lectures, including Java Servlets, JSP, JDBC, JSTL & EL, and the MVC architecture. In addition to this, I've improved my listening skills by taking the time to hear what other team members have to say, understand it, and accept it as well.

For my assigned use cases, "LogIn" and "View Payment History," I helped to draft the suggested solution and create mock-up interfaces. I was in charge of designing the interface for both LogIn and Payment history pages along with the backend and creating the databases. I tried my best to complete the assigned tasks along with writing the report and contributing to the video. My team member, ***Suleman*** *was the PROJECT LEADER; he did the module "Manage Profile" and "Booking History"; he created the Database for the system and also overlooked everybody's work, made corrections and finalized the codes wherever it was necessary. Other member* ***Rezwan****, is in charge of View Train route and Manage Schedule, he also did the swimlane diagram and helped with the Database whereas* ***Ruzhan and Ebrahim*** *are in charge for "Registration", "View Schedule" and "Book Ticket", "Manage Booking" respectively.*
All my teammates pulled off amazing jobs by completing each of their designated tasks.

In terms of how my group is doing, I believe that overall, the project development process is moving along fairly smoothly, despite the fact that we have had a few bumps along the way. However, we were able to overcome those challenges and keep up with the initial schedule that we had established. With my teammates, I am thrilled to build a team. I can see how the project is progressing since I felt like we really helped each other out when we ran into issues. I am grateful for the opportunity to complete this course and create this product.I believe that I cannot successfully develop this project with my team members without the careful instruction of the lecturer and assistance from team members.

Islam Mohammed Ruzhan

This project was meant to develop an application system using java server pages and servlet. Basically, we were assigned to develop a web application in Java using Spring Framework, servlets, JSTL, JDBC, JavaBeans using the MVC architecture in a group. So, through this project, I have gained knowledge about developing a web application using Java and also I have learnt to work in groups with my teammates. By working in a group, I could realize the importance of cooperation and giving respect to others' opinions. I have also been able to gain practical knowledge about application development.

My contributions include writing some parts of the proposal, helping in designing the Use Case diagram. The modules that I was assigned to are the registration and view schedule. I did the Front End design of those pages using HTML and JSP. Then I applied the MVC Framework on my modules and made the controllers and the model according to my modules. For my teammates, ***Sulaiman*** *was responsible for managing user profiles and designing the database. He was the project leader, and he supervised all the modules of the teammates.* ***Rizwan*** *developed the train routes and the managed schedule modules,* ***Ebrahim*** *developed the booking history and managed booking modules and* ***Tamzid*** *developed the login page and the view payment history pages. All the coding of the modules were sent to* ***Sulaiman*** *and he compiled them in a single project and ran the application.*

This project was not an easy thing to do. We faced many problems and hardships during its development. Whenever we faced any error, we would call a team meeting and try to debug the errors. In this way, we solved all the errors and developed the system and in return we got a fully functional website through which the users can book railway tickets for their desired destination. Last of all, I would like to add that I am very proud of what we have developed and it would not have been possible without the support and cooperation of all the teammates.

Ebrahim Abdullah Ahmed Alnuzaili

This project has helped a lot when it comes to develop my skills in software developing and designing as well as to improve my skills in software developing in general. From the get-go of this current semester, Me and my team members have faced many obstacles to choose our project title and purpose. Eventually, We all come up to an agreement that we could potentially make an efficient Train ticket booking management system, that allows passengers to check and inquire trains schedule and departures, booking and cancelling and etc. We had thought about this project as we believe that trains plays a crucial and important role in people's daily life for commuting to work and many other benefits, but we were not sure whether our proposed system could actually deliver all the requirements needed. Nevertheless, throughout the development of this project, I have realized and found that the Train booking management system is worthy to work on and develop a better version than the current existing.

Throughout the entire of this project, I was capable to learn and comprehend an informative experience on developing and designing websites and databases by using Java Servlets, JSP, JDBC, JSTL & EL, as well as the MVC architecture that we have managed to implement them on our project. I believe that these skills and knowledge will assist me perfectly on the future as I aim to be a software developer. I was able to comprehend the materials and the concepts of applying IP on my future projects relatively well as I spent this semester working on this project.

Due to the numerous challenges my team and I had while working on this project, I was also able to develop my teamwork and communication abilities. We were only able to overcome and overcome all of the challenges we faced thanks to an amazing teamwork and communication. For instance, when debating how to uniformize all of our interfaces, we had to put our communication abilities to the test. This is due to the fact that each one of us had been given access to a different component of the system, which made the lack of a uniform user interface obvious during the first phase of the project, which I personally was not around as I joined this group a bit late. However we were only able to effectively complete the assignment because of our great communication and teamwork skills.

Throughout this project, I was assigned to do the modules of Book ticket, View booking history, Manage booking. Although I had many obstacles and challenges to do them as what the system

requires my team had really helped me a lot to complete these tasks successfully especially **Suleman Yacoob and Rizdwan. As well as Tamzid and Ruzhan.**

As a result, this project has significantly aided my development as a software engineering student. This is because it made me use the knowledge I had gained in class to solve an issue in the real world. This project allowed me to practice and further develop my communication and team-working skills. Additionally, to teach me more about technical coding skills because it strongly encouraged us to collaborate with our team members to create this final application.

Muhammad Rizdwan Bin Roslan

During the course of the project, our team faced some challenges in terms of working effectively together. Despite these challenges, we were able to come together and find solutions through open and honest communication. I learned the importance of actively listening to others and valuing their perspectives in order to build a stronger team. In the beginning, we had a clear vision of what we wanted to achieve with the project, but as we progressed, we encountered several roadblocks. We had to be flexible and adapt our approach in order to overcome these challenges. I learned that it is important to be open to new ideas and to be willing to pivot when necessary in order to make progress on a project. In general, I learned that effective teamwork, communication, and a willingness to adapt are crucial for the success of a project.

I used Java Servlets to handle the HTTP requests and responses for my web application. I found that the Servlets provided a powerful and flexible way to handle these requests, and I was able to easily add custom logic to handle different types of requests. I used JSP pages to create the views for my web application. I found that the JSPs were easy to create and maintain, and they allowed me to easily separate the presentation logic from the business logic in my application. I used JDBC to interact with a database in my project. I found that JDBC provided a straightforward way to access and manipulate the data in my database, and I was able to easily perform CRUD operations. I used JSTL and EL to create dynamic web pages in my project. I found that these technologies provided an easy way to create reusable templates and display data from my Servlets

in a more readable format. Lastly, I used the MVC architecture in my project to separate the different concerns of my application. I found that this architecture made it easy to organize and maintain my code, and it allowed for a more modular and testable design. Overall, I found that the use of Java Servlets, JSP, JDBC, JSTL & EL, as well as the MVC architecture helped to make my project more structured, organized, and maintainable. I also found that these technologies are widely adopted, and it's easy to find resources and examples of how to use them.

During the project planning and execution, I contributed in constructing a flow for the system using a swimlane diagram and designed the interface and developed the code for Manage Schedule Module and View Train Route Module. As for Ruzhan, he was participating in the design of the use case diagram and has been assigned to work on the Registration Module and View Schedule Module. Ebrahim handled the Booking History Module and Manage Booking Module and Tamzid developed the Login Module and View Payment History Module. My team member Sulaiman was in charge of the Manage Profile Module, View Booking History Module designing the database, and acted as the project leader overseeing all the modules. All the code was then consolidated and compiled by Sulaiman, who then ran the final application.