CS301 Project Report

Railway-Reservation-System

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Table Details [DB File Link]

Tables	Attributes
admin	**username**, password
user	**username**, name, email, address, password
train	**t_number, t_date,** num_ac, num_sleeper, released_by
train_status	**t_number**, **t_date**, seats_b_ac, seats_b_sleeper
ticket	**pnr_no**, coach, booked_by, booked_at, t_number, t_date
passenger	name, age, gender, **pnr_no**, **berth_no**, berth_type, **coach_no**

**Bold attributes denote Primary Keys*

I. ***admin*** table stores the username & password of admins.
II. ***user*** table stores the basic information about all the users registered on the portal.
III. ***train*** table has the details of a train released by the admin, including train number, date of journey, number of AC & Sleeper Coaches available.
IV. ***train_status*** table stores the total number of seats booked in AC & Sleeper Coaches of all the trains released in the portal.
V. ***ticket*** table stores the details of a ticket, namely PNR number, coach(AC/Sleeper) for which ticket is booked, train number, train date, name of the user who booked the ticket.
VI. ***passenger*** table stores the information related to all passengers, their basic info, including name, age & gender, and details of their booking, including their berth number, coach number, and berth type.

Foreign Key Relationships

I. train_status
    A. ***released_by*** refer to *username* in the admin table
II. train_status
    A. ***t_number*** and ***t_date*** refer to *t_number* and *t_date* in the train table

III. ticket
    A. ***booked_by*** refer to *username* in the user table
    B. ***t_number*** and ***t_date*** refer to *t_number* and *t_date* in the train table
IV. passenger
    A. ***pnr_no*** refer to *pnr_no* in the ticket table

Attribute Information

I. **num_ac**: Number Of AC Coaches in the train
II. **num_sleeper**: Number Of Sleeper Coaches in the train
III. **seats_b_ac**: Total Number of Seats Booked in the AC Coaches of the train
IV. **seats_b_sleeper**: Total Number of Seats Booked in the Sleeper Coaches of the train
V. **coach**: Choice Of Coach (AC/Sleeper)

Stored Procedures [Code Link]

I. check_email_registered

A. Checks whether an email has been already registered or not when a new user registers on the portal

II. check_username_registered

A. Checks whether a username has been already taken or not when a new user registers on the portal

III. check_admin_credentials

A. Checks for admin username & password during login

IV. check user_credentials

A. Checks for user's username & password during login

V. check_train_details

A. Checks whether the date selected by the user while booking is valid, i.e.
    1. The date is not in the past
    2. The date is at most 2 months from the current date
B. Checks whether the selected train has been released in the system by the admin or not

VI. check_seats_availabilty

A. Checks whether sufficient seats are available in the coach (AC/Sleeper) selected by the user

VII. generate_pnr

A. Generates a unique PNR number

B. Inserts into the ticket table

VIII. assign_berth

A. Assigns berth_no, coach_no and finds the corresponding berth_type

B. Insert into passenger table

IX. check_valid_pnr

A. Checks whether the PNR Number given as input by the user for viewing ticket(Details in Other Functionality heading) is valid or not

Triggers [Code Link]

I. before_train_release

Operation - BEFORE INSERT

Table - train

A. Checks if the train is released at least one month before the journey date and also at most 4 months in advance

B. Checks whether the same train is already released for the same date in the system

C. Checks if the number of coaches is not zero, i.e., at least one coach must be present (AC/Sleeper)

II. check_ticket_update

Operation - BEFORE UPDATE

Table - ticket

A. Prevents update of ticket details (pnr_no & coach)

III. check_booked_seats

Operation - BEFORE UPDATE

Table - train_status

A. Checks booked seats are not more than available seats in both AC & Sleeper Coach

IV. before_berth_assign

Operation - BEFORE INSERT

Table - passenger

A. Checks, whether the berth number & coach number assigned, is already assigned to some other passenger for the same train number and date of journey and coach(AC/Sleeper) or not

Server Side Validations

I. For Login, Register, Train Release, Ticket Booking : all field must be non-empty

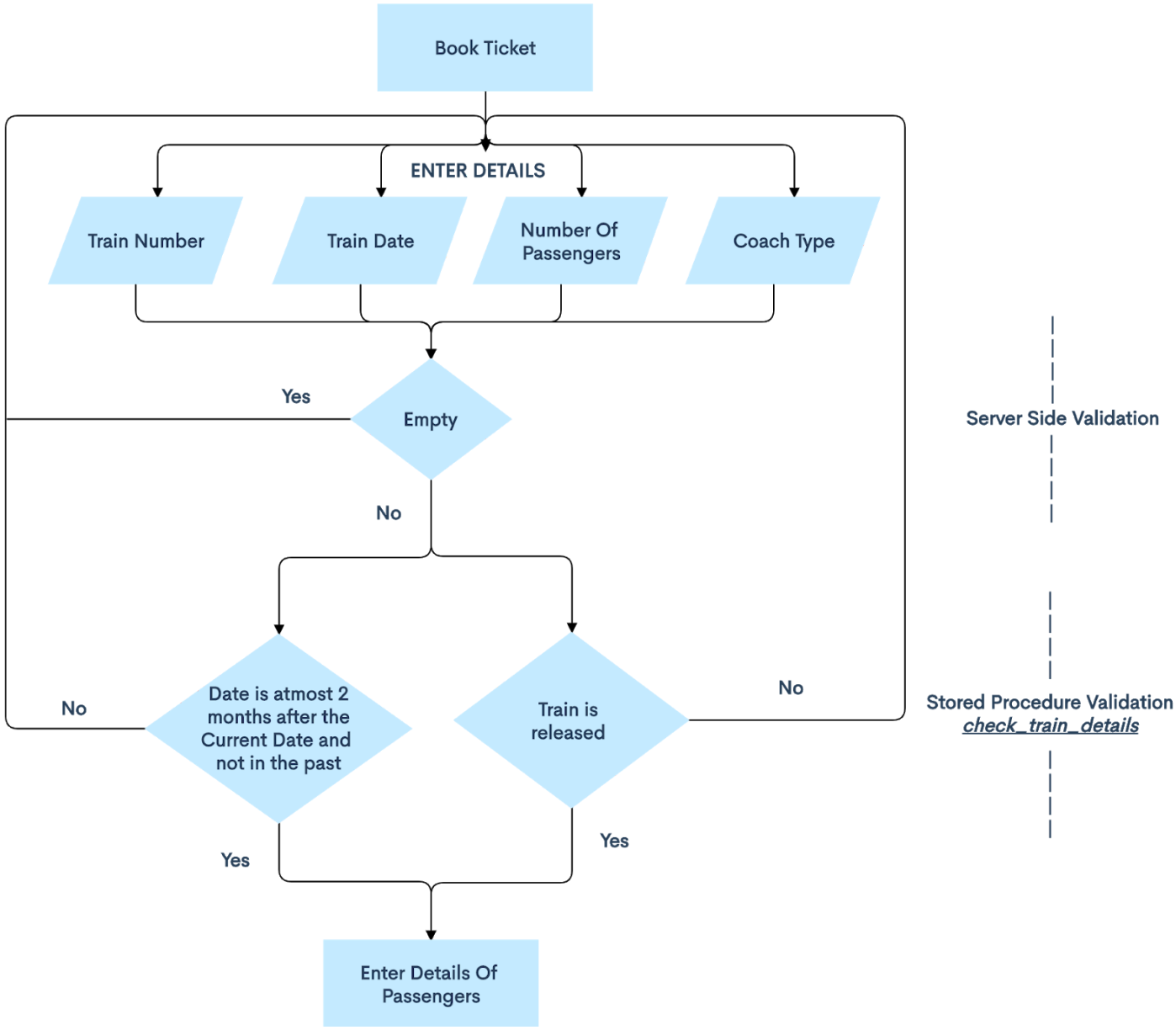
II. Register:

A. Password - Minimum of 8 characters

B. Username - Must contain letters only

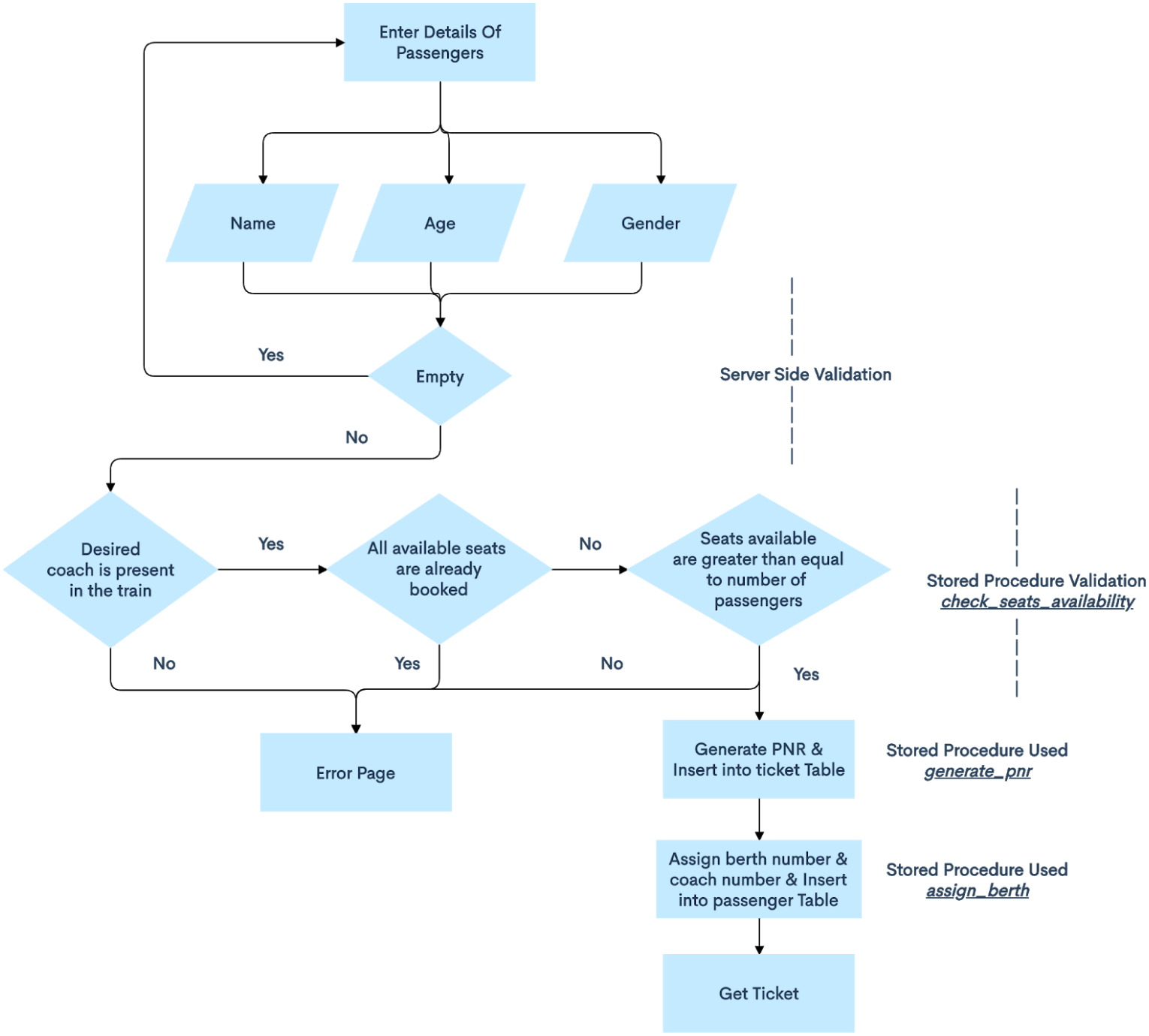
Ticket Booking Procedure

Step-I Checking Train Availability



Flowchart Depicting Step-1 Of Ticket Booking Procedure

Step - II Getting Passenger Details, Checking Seats Availability & Generating Ticket



Flowchart Depicting Step-2 Of Ticket Booking Procedure

PNR Generation [Code Link]

The stored procedure *generate_pnr* is used to generate PNR for a particular booking.

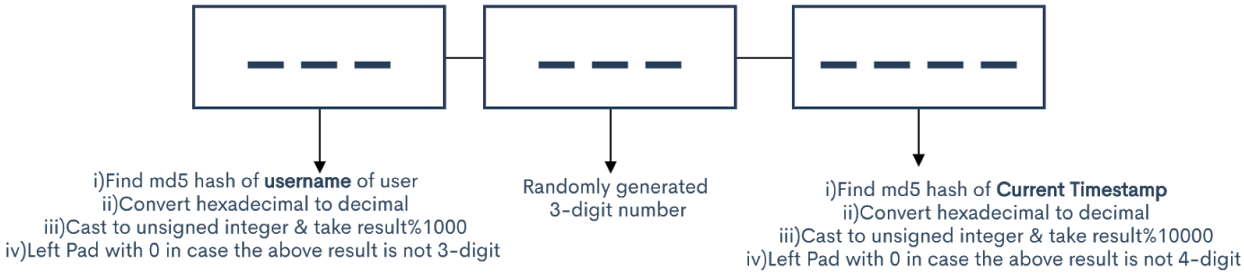


Figure Showing PNR Generation

After the PNR Number is generated, it is inserted in the ticket table along with other attributes.

Logic For Assigning Berth Number & Coach Number [Code Link]

The stored procedure *assign_berth* is used to assign berth number, coach number & corresponding berth type to each passenger. After generating PNR number & insertion in the ticket table, *assign_berth* is called for each passenger using a for loop.

In the *assign_berth* procedure, firstly the train_status table is updated, i.e., the number of seats booked (seats_b_ac/seats_b_sleeper) is increased by 1 in the train_status table. Then, using the below statement, coach number & berth number can be found. Here tseats = 18 for AC coach & 24 for Sleeper Coach and bseats = booked seats in AC/Sleeper Coach.

```
IF bseats % tseats = 0 THEN
    SET coach_no = bseats/tseats;
    SET berth_no = tseats;
ELSE
    SET coach_no = floor(bseats/tseats) + 1;
    SET berth_no = bseats%tseats;
END IF;
```

After finding berth number & coach number, berth type is found and then the corresponding values are inserted in the passenger table.

Illustration Of Berth Assigning Process

Let us assume the following details.

Train number	Date	Number of AC Coaches	Number Of Sleeper Coaches	Seats Booked in AC Coach	Seats Booked in Sleeper Coach
1	01-01-2021	3	2	34	45

Now, if the user wants to book ticket for 3 passengers in the AC Coach.Then

Passenger 1 -> tseats = 18; bseats = 34+1 = 35 [35%18 != 0]

Coach No = floor(35/18) + 1 = 2 & Berth No = 35%18 = 17

Since 17%6 = 5 Berth_type = 'SL'

Passenger 2 -> tseats = 18; bseats = 35+1 = 36 [36%18 = 0]

Coach No = 36/18 = 2 & Berth No = 18

Since 18%6 = 0 Berth_type = 'SU'

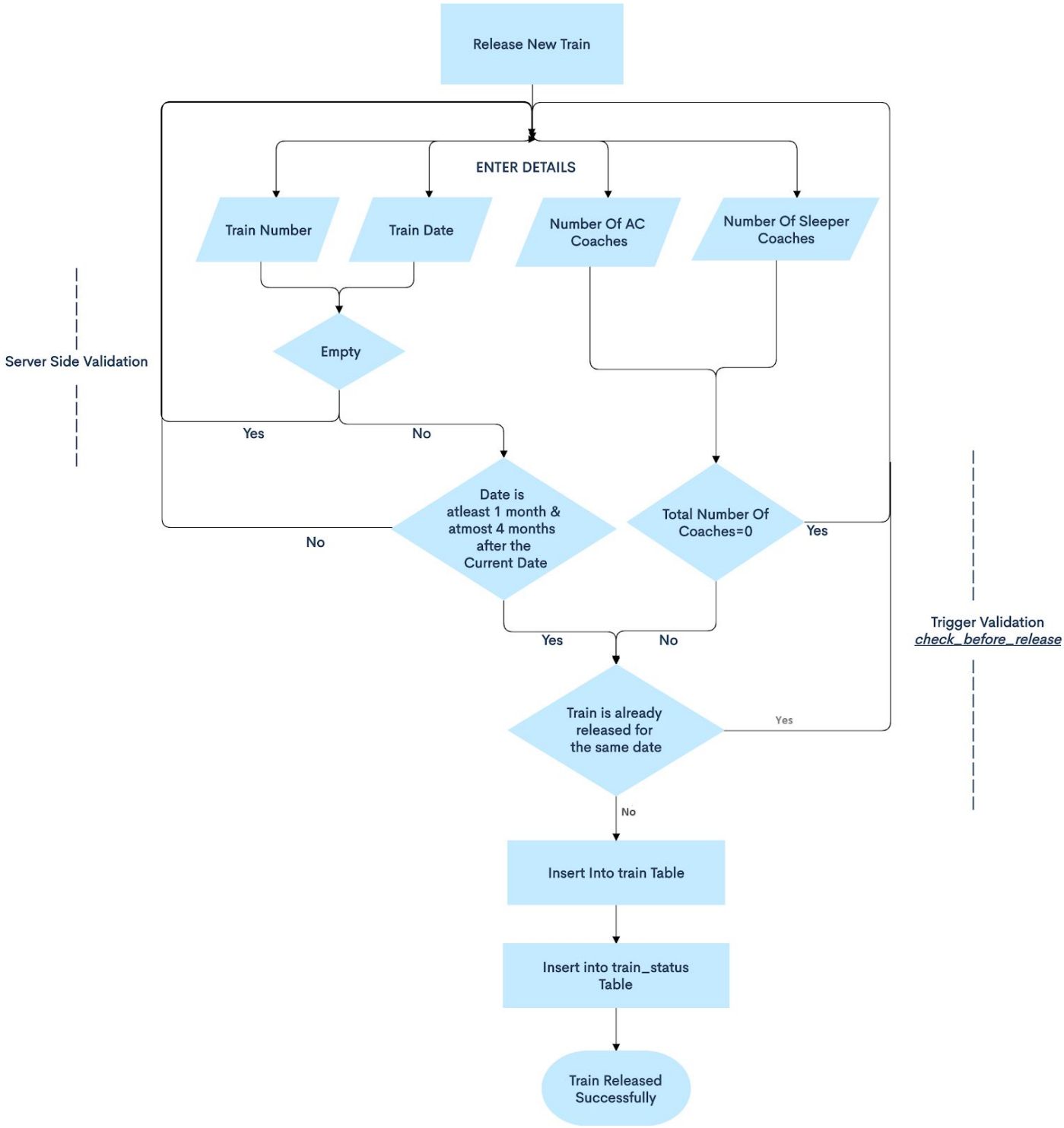
Passenger 3 -> tseats = 18; bseats = 36+1 = 37 [37%18 != 0]

Coach No = floor(36/18) + 1 = 3 & Berth No = 37%18 = 1

Since 1%6 = 1 Berth type = 'LB'

Now, if the user wants to book a ticket for 4 passengers in the sleeper coach. Then, since sufficient seats are not available, hence the user will be redirected to the error page and no booking will be made.

Train Release Procedure



Flowchart Depicting Train Release Procedure

Other Functionalities

I. View Ticket

Users can view the ticket by entering a valid PNR Number

II. View All Released Trains

Both admins and users can see the details (train number, date of journey, number of AC & sleeper coaches) of all released trains.

III. Check Train Status

Both admins and users can view the number of seats available for booking by entering a valid train number & date of journey.

IV. View All Users

Admins can see the details of all users registered in the system.

V. View All Bookings

Admins can also view details of bookings made by all the users.

VI. View Previous Bookings

All users can view the details of the bookings made by them in the past.

Assumptions

I. Admins are added to the table manually.

II. There are 2 admins added in admin table - **admin, admin1**(password is same as username)

III. Trains can be released at least 1 month before and at most 4 months before the journey date.

IV. Users can book tickets at most 2 months in advance.

V. Number of passengers attribute is not added in the table - ticket as number of passengers associated with a particular ticket can be found by using the following query -

SELECT ticket.pnr_no, COUNT(*) as num_passengers

FROM ticket, passenger

WHERE ticket.pnr_no = passenger.pnr_no

GROUP BY ticket.pnr_no;

Technology Stack

I. Frontend - HTML, CSS, Bootstrap
II. Backend - PHP
III. Database - MYSQL

Steps To Run Locally

I. Install XAMPP on your system
II. Copy the folder railway-reservation-sytem in `C:/xampp/htdocs`
III. Start Apache & Mysql Servers from XAMPP Control Panel
IV. Visit http://localhost/phpmyadmin on your browser
V. Create a new database rdb and then click Import
VI. Select sql/rdb.sql & database will be loaded
VII. Open http://localhost/railway-reservation-system on your browser

Demo GIF Link

https://drive.google.com/file/d/1BRyHkRx30GjtXc4w-8bsjMQrENRnZYmj/view?usp=sharing

Google Drive Link For Complete Code

https://drive.google.com/drive/folders/1VVbGq_sW8ZXqRO1FYjfVMccgfDmLCLeP?usp=sharing