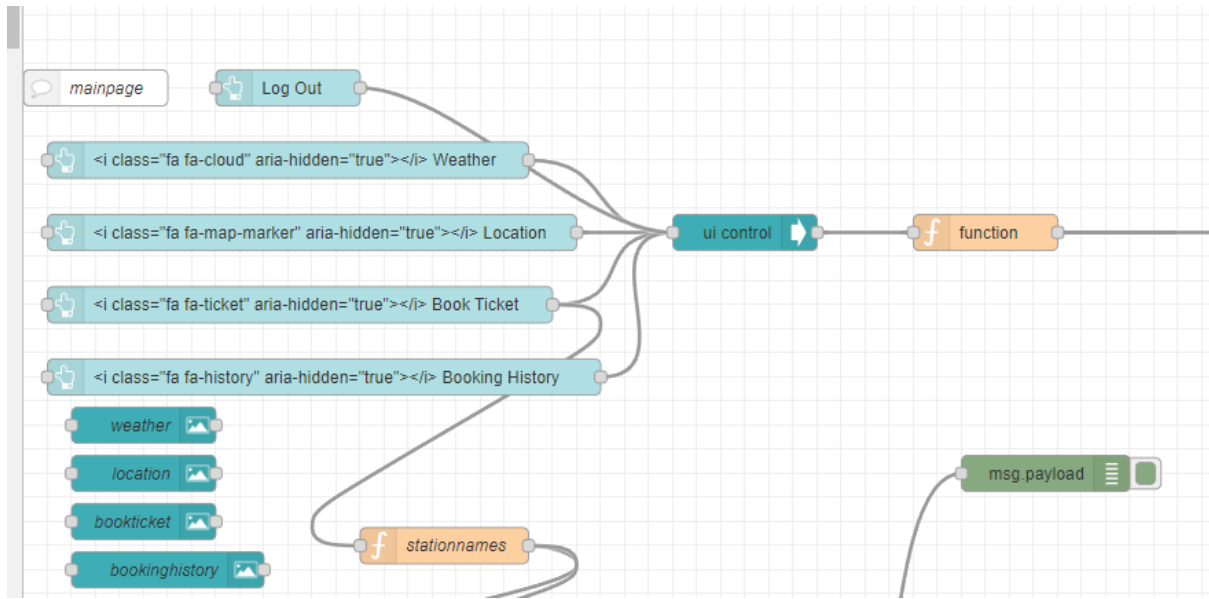


Project Development Phase

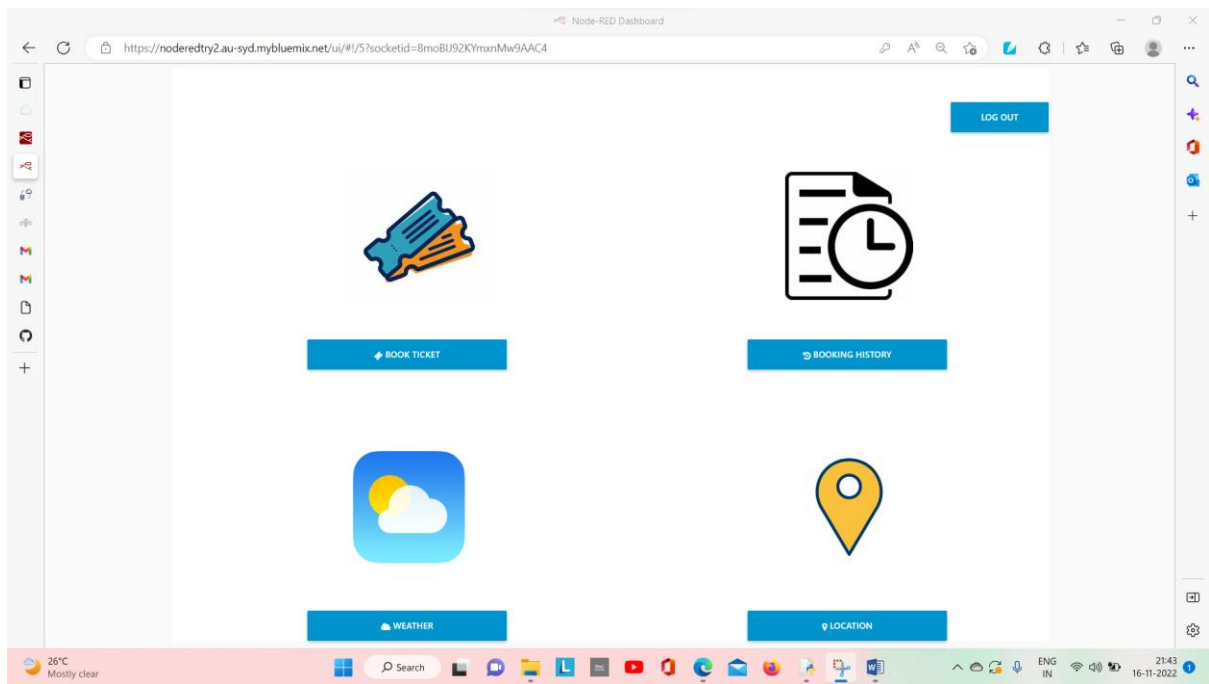
Sprint-2

Team ID	PNT2022TMID35843
Project Name	Smart Solutions for Railways

1.) Main Page Node-Red Flow



Main Page in UI



- Book Ticket button will open the Booking page

Key Features of the Booking Page

- Upon selecting the Boarding, Destination and Date, in Train Name field only the Train's which Satisfies the above-selected options will be displayed.
- Upon selecting the Train only the classes which are free for that particular train will be displayed.
- Then selecting the class will notify how many seats are available
- Then the user has to enter the No of seats he wants to book and then press the submit button if the No of seats are more than available then it will notify the user about the situation and will ask again.
- Submit button will be enabled only when all the details match correctly.

We have used two Databases for this “trainavailability” and “trainseatavailability”

“trainavailability” Database

<div> <div>trainavailability</div> <div> <div>All Documents</div> <div>Query</div> <div>Permissions</div> <div>Changes</div> <div>Design Documents</div> </div> </div>	<div> <div>Document ID</div> <div>Options</div> <div>{ } JSON</div> <div>Create Document</div> </div> <div> <div>Table</div> <div>Metadata</div> <div>{ } JSON</div> </div> <div> <div>_id</div> <div>day</div> <div>destinations</div> </div> <div> <div>Chennai</div> <div>{ "Monday": [["Train1"], ["Train1"]], "Tu...</div> <div>["Hyderabad", "Kerala"]</div> </div> <div> <div>Hyderabad</div> <div>{ "Monday": [["Train4", "Train5"], ["Train...</div> <div>["Chennai", "Kerala"]</div> </div> <div> <div>Kerala</div> <div>{ "Monday": [["Train7"], ["Train7"]], "Tu...</div> <div>["Hyderabad", "Chennai"]</div> </div>
--	--

File inside “trainavailability” is structured this way

```

1 {
2   "_id": "Chennai",
3   "_rev": "5-321ea013507e2ef8aa9929e94f0b3b89",
4   "destinations": [
5     "Hyderabad",
6     "Kerala"
7   ],
8   "day": {
9     "Monday": [
10      [
11        "Train1"
12      ],
13      [
14        "Train1"
15      ]
16    ],
17    "Tuesday": [
18      [
19        "Train2",
20        "Train6"
21      ],
22      []
23    ],
24    "Wednesday": [
25      [],
26      []
27    ],
28    "Thursday": [
29      [],
30      []
31    ],
32    "Friday": [
33      []
34    ]
35  }
36 }

```

Key Features of this Database files

1. File “_id” is given as boarding station so that while using cloudant node in Node-Red we can return only the file matching the selected boarding station using “search by “_id” option.
2. So this database gives the availability of trains that satisfies the boarding, destination and day of the selected date .

“trainseatavailability” Database

Id	key	value
Train1	Train1	{ "rev": "12-6acd5c569b5034771f4f4f18c528daa..." }
Train10	Train10	{ "rev": "1-06eeff89c7d0b8c1ccfa1074ea396175" }
Train2	Train2	{ "rev": "1-06eeff89c7d0b8c1ccfa1074ea396175" }
Train3	Train3	{ "rev": "1-921ba35cc723a01afe8f6ea6786056f3" }
Train4	Train4	{ "rev": "3-51274ab60e31a8a1c677a96e2b1bb0c..." }
Train5	Train5	{ "rev": "1-06eeff89c7d0b8c1ccfa1074ea396175" }
Train6	Train6	{ "rev": "3-da099d78bda31da9c5cf5e746c009e2..." }
Train7	Train7	{ "rev": "3-6a44235addaf8c5d0c5885bdcf80161" }
Train8	Train8	{ "rev": "1-06eeff89c7d0b8c1ccfa1074ea396175" }
Train9	Train9	{ "rev": "4-94227d7dd31f1a843b1145c2a62e274..." }
train1	train1	{ "rev": "70-f70cbe7e9eb078352caa1aa4c16aa0..." }
train2	train2	{ "rev": "6-854b3dc5bab09e6b7f7613f3dcb5ba5..." }

Total number of Trains:10

File inside “trainavailability” is structured this way

```
1 {  
2   "_id": "Train1",  
3   "_rev": "12-6acd5c569b5034771f4f4f18c528daac",  
4   "1AC": 5,  
5   "2AC": 0,  
6   "3AC": 1,  
7   "Sleeper Class": 0,  
8   "Second Class": 5,  
9   "General Class": 5  
10 }
```

Key Feature of this database file

1. “_id” is given as train name to make use of search by “_id” option in the cloudant node.

We have scheduled our Trains in database according to this tabular column

1. “1” represents availability and “0” represents it’s not available
2. Check the available trains for a specific boarding and destination pair from the below tabulation.

Boarding station	Destination station	Train 1	Train 2	Train 3	Train 4	Train 5	Train 6	Train 7	Train 8	Train 9	Train 10
Chennai	Hyderabad	1	1	0	0	0	1	0	0	0	0
Kerala	Chennai	0	0	1	0	0	0	1	0	0	1
Kerala	Hyderabad	0	0	1	0	0	0	1	0	0	0
Chennai	Kerala	1	0	0	0	0	0	0	1	0	0
Hyderabad	Chennai	0	0	0	1	1	0	0	0	0	0
Hyderabad	Kerala	0	0	0	1	0	0	0	0	1	0

Let me explain the flow with an example

- For Chennai to Hyderabad Train 1 ,Train 2 Train6 are available (from the table above)
- Now to check on which dates are this trains available we have to refer to the below table

Trains no	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Train 1	1	0	0	0	1	0	0
Train 2	0	1	0	0	0	1	0
Train 3	0	0	1	0	0	1	0
Train 4	1	0	0	0	0	0	0

Train 5	1	0	0	0	0	0	1
Train 6	0	1	0	0	1	0	0
Train 7	1	0	0	0	0	0	0
Train 8	0	0	0	0	0	0	1
Train 9	0	0	1	0	0	0	1
Train 10	0	0	1	0	0	0	0

From this table we can say that

- Train 1 is available on Monday and Friday,
- Train 2 is available on Tuesday and Saturday ,
- Train 6 is available on Tuesday and Friday.,
- So on Friday Train 1 and Train 6 are available from Chennai to Hyderabad

Suppose if train 6 is selected,

- Then we have to display only the classes for which seats are available in that train.
Seat availability is checked using “trainseatavailability” database.

```

1 {
2   "_id": "Train6",
3   "_rev": "4-ac89f8d71b5823dcea712cf88d602393",
4   "1AC": 1,
5   "2AC": 0,
6   "3AC": 5,
7   "Sleeper Class": 5,
8   "Second Class": 5,
9   "General Class": 5
10 }
```

- For train 6 2AC seats are not available so except that all other classes will be displayed .

Flow of explained example

The screenshot shows a train booking form with the following fields: Boarding Station (Chennai), Destination (Hyderabad), Date (with a calendar picker open), Train Name, Class Type, and No of Seats. The date picker is set to November 2022, with the 16th and 25th highlighted. A blue 'SUBMIT' button is visible at the bottom left of the form.

Boarding Station: Chennai
Destination Station: Hyderabad
Day: Friday


- So Train 1 and Train 6 will be displayed

The screenshot shows the same train booking form, but now with 'Train1' selected in the Train Name field and 'Train6' selected in the Class Type field. The date field is set to 25/11/2022. The 'No of Seats' field is empty. At the bottom, there are two buttons: a light blue 'SUBMIT' button and a dark blue 'GO BACK' button.

- Now selecting Train 6
- Except class 2AC other classes will be displayed

Boarding Station Chennai ▼

Destination Hyderabad ▼

Date  25/11/2022 ▼

Train Name Train6 ▼

Class Type 1AC ▼

No of Seats 3AC

SUBMIT **BACK**

Sleeper Class


Second Class

General Class

- Now selecting 1AC will show the no of seats available

Boarding Station Chennai ▼

Destination Hyderabad ▼

Date  25/11/2022 ▼

Train Name Train6 ▼

Class Type 1AC ▼

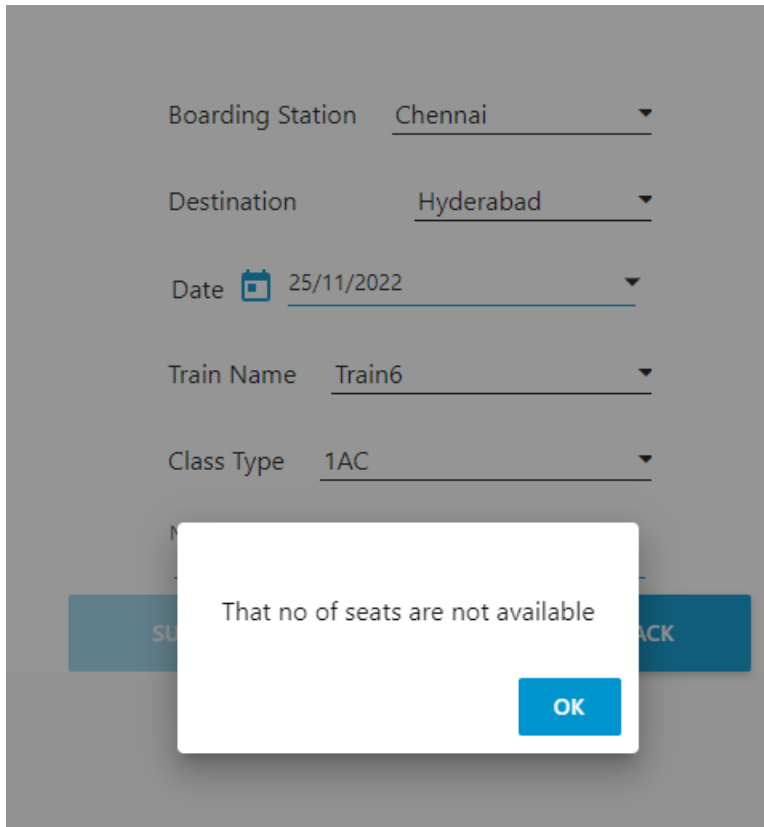
No of Seats

SUBMIT **BACK**

1 seats are available

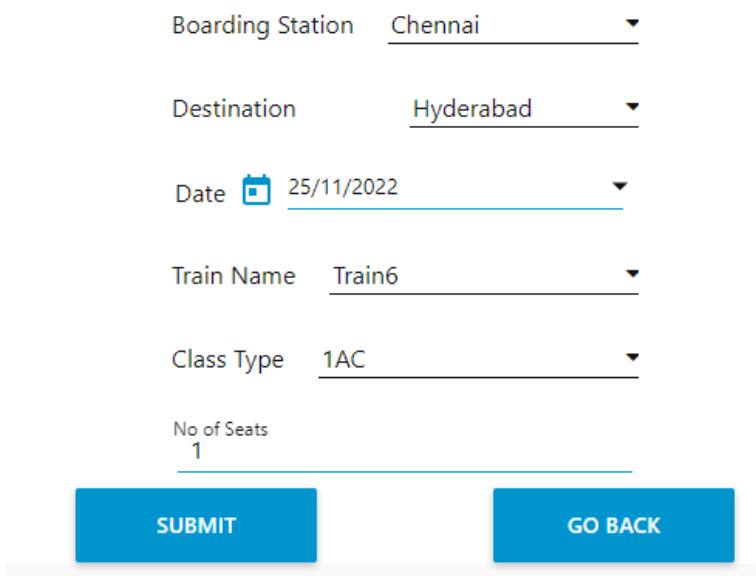
OK

- If the user enter more no of seats than available then this notification shows up



A screenshot of a train booking form. The form has five dropdown menus: 'Boarding Station' (Chennai), 'Destination' (Hyderabad), 'Date' (25/11/2022), 'Train Name' (Train6), and 'Class Type' (1AC). Below these is a 'No of Seats' input field. A modal dialog box is centered over the form, displaying the text 'That no of seats are not available' and an 'OK' button. The background form is dimmed.

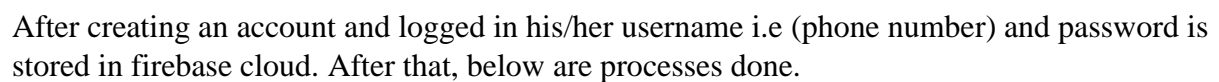
- If no of seats are less than or equal to available seats then submit button will be enabled and booked no of seats will be updated in the cloud.



A screenshot of the same train booking form. The 'Boarding Station', 'Destination', 'Date', 'Train Name', and 'Class Type' dropdowns are the same. The 'No of Seats' input field now contains the number '1'. The 'SUBMIT' button is now enabled (solid blue), while the 'GO BACK' button remains disabled (light blue). The modal notification is no longer present.

- If no trains are available for a selected date from Chennai to Hyderabad then this will be displayed.

FIREBASE DATA BASE PAGE FOR STORING USERNAME AND PASSWORD OF USER.



DASHBOARD



ON DASHBOARD WE PROVIDE THREE FEATURES:-

- Weather
- Live location
- Bookings

ON CLICKING BOOKINGS BUTTON

Work flow

Passenger is able to select his/her

1. Boarding and departure locations
2. Date of travel
3. Search and pick available train on current date
4. Then, click okay to proceed to payment page.

1. BOOKINGS PAGE



8:44 26.0 KB/S VoLTE 4G 52%

Reservation page

Back

FROM Choose city

TO Choose city

Select date: Choose date

Search available trains

Choose Train

Okay

CHOOSING BOARDING AND DEPARTURE LOCATION, DATE OF TRAVEL AND PICKING AVAILABLE TRAIN:-

The image shows two sequential screenshots of a mobile application's 'Reservation page'. The first screenshot (left) shows the initial form with fields for 'FROM', 'TO', and 'Select date', each with a 'Choose' button. Below these are buttons for 'Search available trains' and 'Choose Train' (in red). The second screenshot (right) shows the form filled with 'Coimbatore Junction' for 'FROM', 'MGR Chennai Central' for 'TO', and '17/11/2022' for 'Select date'. Below the 'Search available trains' button, a list of available trains is displayed: '1234-Coimbatore intercity', '1000-Mangalore Express', '1001-Yercaud Express', and '1002-Salem-Egmore Express'. The '1001-Yercaud Express' is highlighted with a red border and a red 'Choose Train' button is shown below it. Blue arrows indicate the flow from the first screenshot to the second, and then to the third (partially visible on the right).

Reservation page

Back

FROM Choose city

TO Choose city

Select date: Choose date

Search available trains

Choose Train

Okay

Reservation page

Back

FROM Coimbatore Junction

TO MGR Chennai Central

Select date: 17/11/2022

Search available trains

Available Trains

Search list...

1234-Coimbatore intercity

1000-Mangalore Express

1001-Yercaud Express

1002-Salem-Egmore Express

1001-Yercaud Express

Okay

Available trains listview forms a drop down menu with available trains for that particular route.

Choose train button used to choose one train from the available trains and store for travel