RAILWAY MANAGEMENT SYSTEM

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INTRODUCTION

This project is about managing railway network for different States and railway ticket booking. The project is a web application which will manage data about the States with their stations, train routes, train schedules, trains and finally passengers as users to the application. It will have two sections namely Admin and Users.

In the Admin section admin will be able to add entities like trains, their routes, schedules, states and will be able to generate reports based on the users data from the users section.

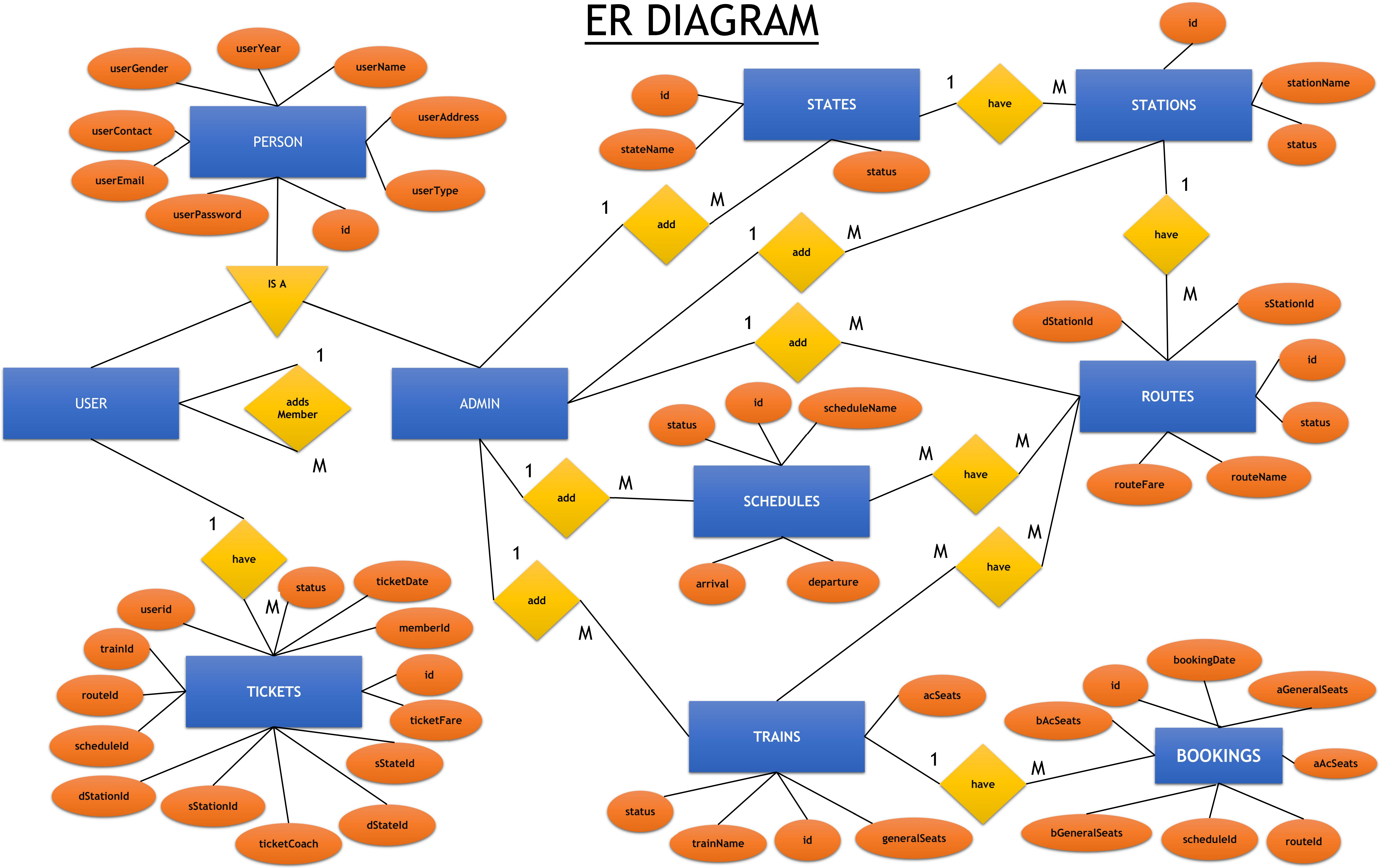
In the users section, a user will be able to book railway ticket by providing information like source and destination station within or in different cities, date and time(schedule) of travel and number of tickets. The user will also be able to add members to his/her account so that he/she can book multiple tickets.

REQUIREMENTS

The web app uses HTML and CSS in the front-end and javascript at the back-end. The database is managd using MySQL server.

The app uses NodeJS, which is an asynchronous event-driven JavaScript runtime environment. App also uses ExpressJS , which is a minimal web framework for NodeJS for developing web applications. Bootstrap is used for the CSS and markup is compiled using Handlebars as the view engine for Express.

ER DIAGRAM


userYear
userGender
userName
userAddress
userContact
PERSON
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userType
userPassword
id
IS A
USER
1
adds Member
M
ADMIN
1
have
M
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status
ticketDate
memberId
trainId
TICKETS
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routeId
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scheduleId
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dStationId
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ticketCoach
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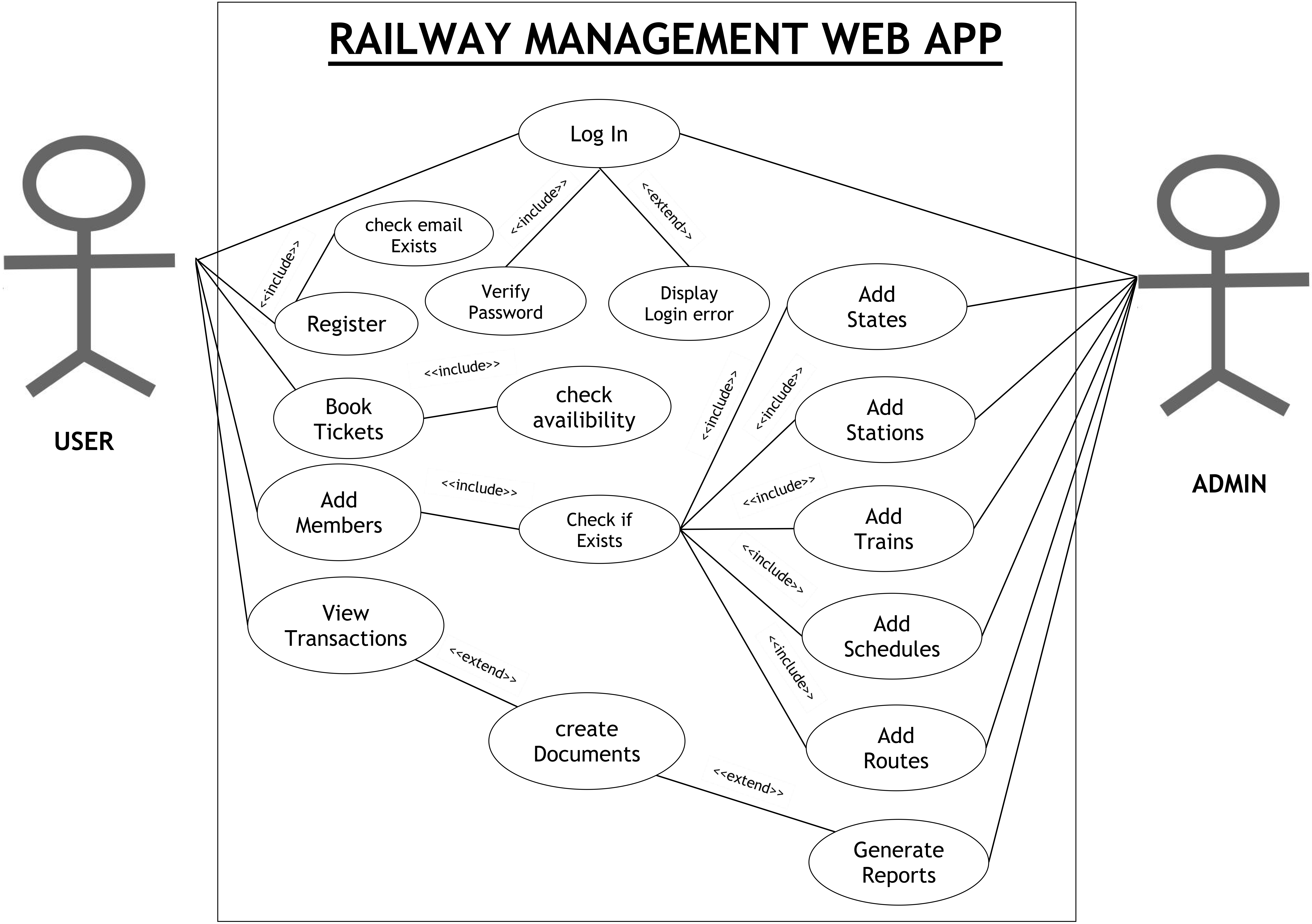
scheduleId
routeId


RAILWAY MANAGEMENT WEB APP
USER
ADMIN
Log In
<<include>>
<<extend>>
check email Exists
<<include>>
Register
Verify Password
Display Login error
Add States
<<include>>
Book Tickets
check availibility
<<include>>
<<include>>
Add Stations
Add Members
<<include>>
Check if Exists
<<include>>
Add Trains
<<include>>
Add Schedules
View Transactions
<<extend>>
<<include>>
Add Routes
create Documents
<<extend>>
Generate Reports

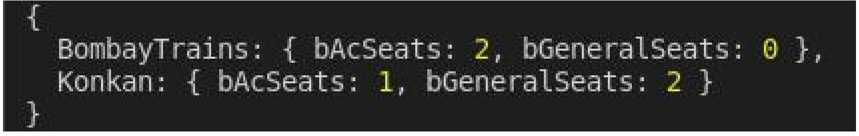
IMPLEMTATION

Models:

1. **Bookings:**

   a) *getBookingsThisMonth(adminId);*

   i. OUTPUT: *Objects of train Bookings.*

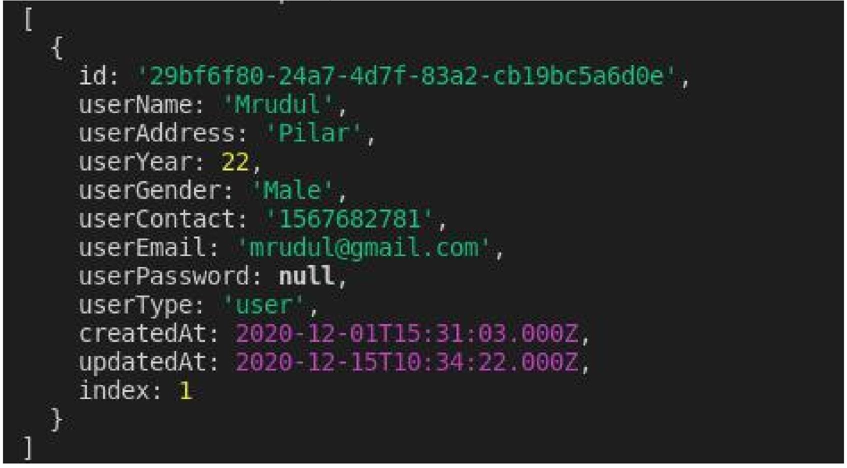


```
{
  BombayTrains: { bAcSeats: 2, bGeneralSeats: 0 },
  Konkan: { bAcSeats: 1, bGeneralSeats: 2 }
}
```

2. **Members:**

   a) *getMembers(adminId);*

   i. OUTPUT: *Array of users.*



```
[
  {
    id: '29bf6f80-24a7-4d7f-83a2-cb19bc5a6d0e',
    userName: 'Mrudul',
    userAddress: 'Pilar',
    userYear: 22,
    userGender: 'Male',
    userContact: '1567682781',
    userEmail: 'mrudul@gmail.com',
    userPassword: null,
    userType: 'user',
    createdAt: 2020-12-01T15:31:03.000Z,
    updatedAt: 2020-12-15T10:34:22.000Z,
    index: 1
  }
]
```

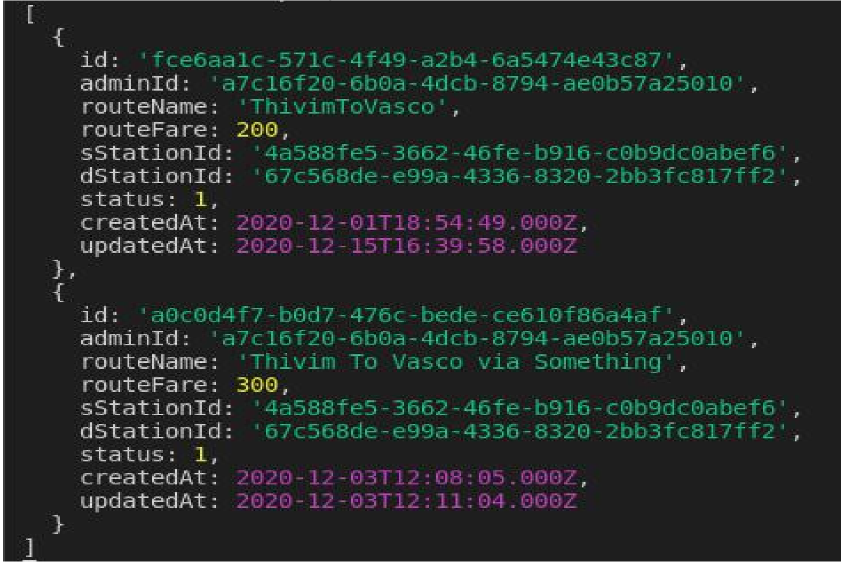
   b) *saveMember(member, adminId);*

   i. OUTPUT: *void*

3. ***Routes:***

   a) getRoutesBetweenStations(sStationId, dStationId);

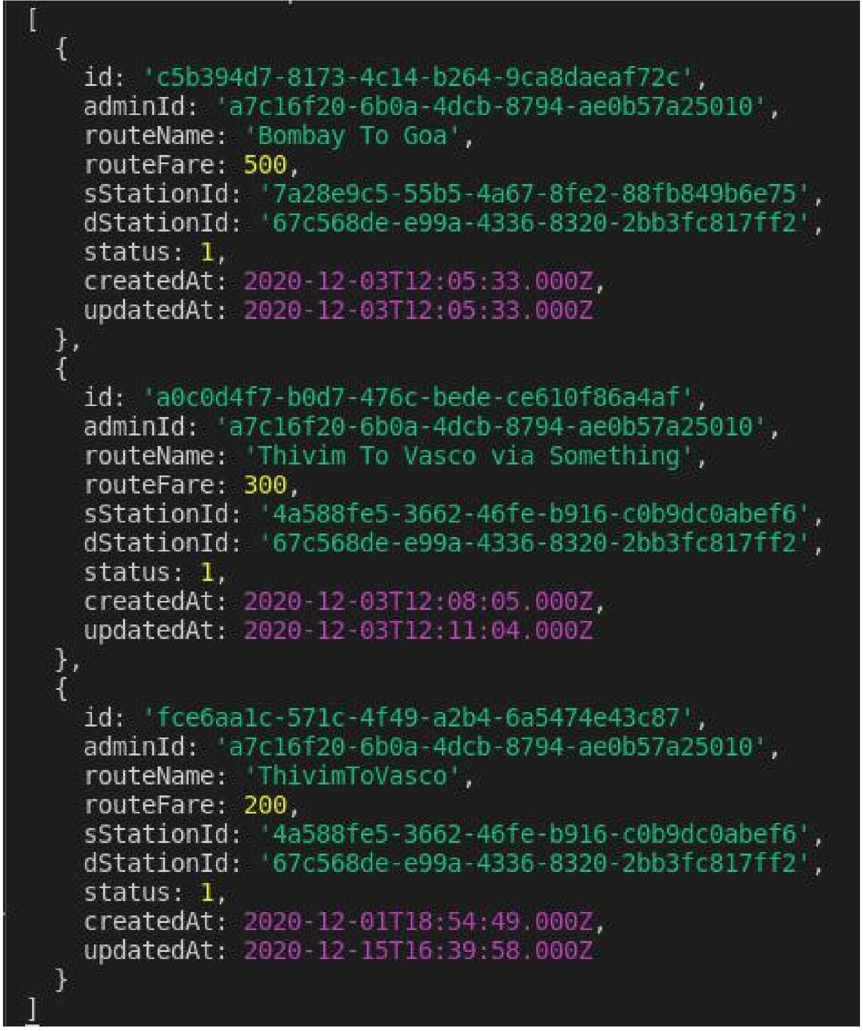
   i. OUTPUT: *Array of Routes.*



```
[
  {
    id: 'fce6aa1c-571c-4f49-a2b4-6a5474e43c87',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    routeName: 'ThivimToVasco',
    routeFare: 200,
    sStationId: '4a588fe5-3662-46fe-b916-c0b9dc0abef6',
    dStationId: '67c568de-e99a-4336-8320-2bb3fc817ff2',
    status: 1,
    createdAt: 2020-12-01T18:54:49.000Z,
    updatedAt: 2020-12-15T16:39:58.000Z
  },
  {
    id: 'a0c0d4f7-b0d7-476c-bede-ce610f86a4af',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    routeName: 'Thivim To Vasco via Something',
    routeFare: 300,
    sStationId: '4a588fe5-3662-46fe-b916-c0b9dc0abef6',
    dStationId: '67c568de-e99a-4336-8320-2bb3fc817ff2',
    status: 1,
    createdAt: 2020-12-03T12:08:05.000Z,
    updatedAt: 2020-12-03T12:11:04.000Z
  }
]
```

b) *getRoutes(adminId);*

i. OOTPUT: *Array of Routes.*

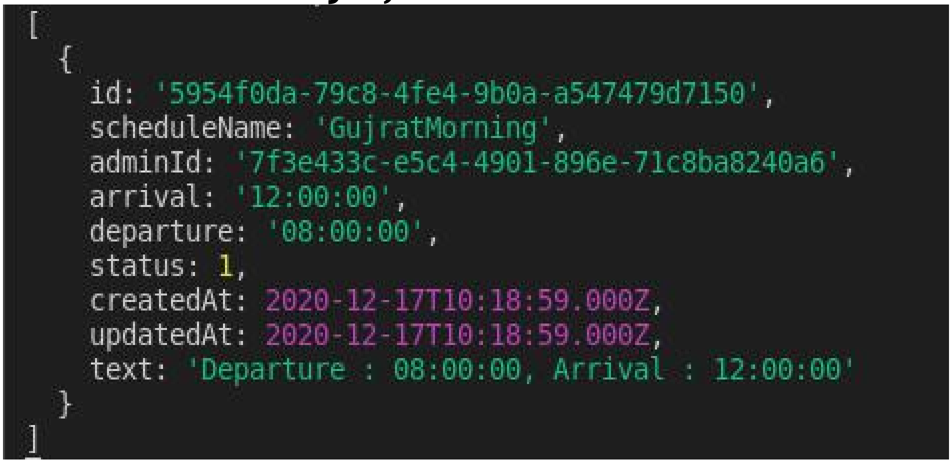


```
[
  {
    id: 'c5b394d7-8173-4c14-b264-9ca8daeaf72c',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    routeName: 'Bombay To Goa',
    routeFare: 500,
    sStationId: '7a28e9c5-55b5-4a67-8fe2-88fb849b6e75',
    dStationId: '67c568de-e99a-4336-8320-2bb3fc817ff2',
    status: 1,
    createdAt: 2020-12-03T12:05:33.000Z,
    updatedAt: 2020-12-03T12:05:33.000Z
  },
  {
    id: 'a0c0d4f7-b0d7-476c-bede-ce610f86a4af',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    routeName: 'Thivim To Vasco via Something',
    routeFare: 300,
    sStationId: '4a588fe5-3662-46fe-b916-c0b9dc0abef6',
    dStationId: '67c568de-e99a-4336-8320-2bb3fc817ff2',
    status: 1,
    createdAt: 2020-12-03T12:08:05.000Z,
    updatedAt: 2020-12-03T12:11:04.000Z
  },
  {
    id: 'fce6aa1c-571c-4f49-a2b4-6a5474e43c87',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    routeName: 'ThivimToVasco',
    routeFare: 200,
    sStationId: '4a588fe5-3662-46fe-b916-c0b9dc0abef6',
    dStationId: '67c568de-e99a-4336-8320-2bb3fc817ff2',
    status: 1,
    createdAt: 2020-12-01T18:54:49.000Z,
    updatedAt: 2020-12-15T16:39:58.000Z
  }
]
```

4. **RouteSchedule:**

a) *getSchedules(routeId, ifAll);*

i. OUTPUT: *Array of schedules.*

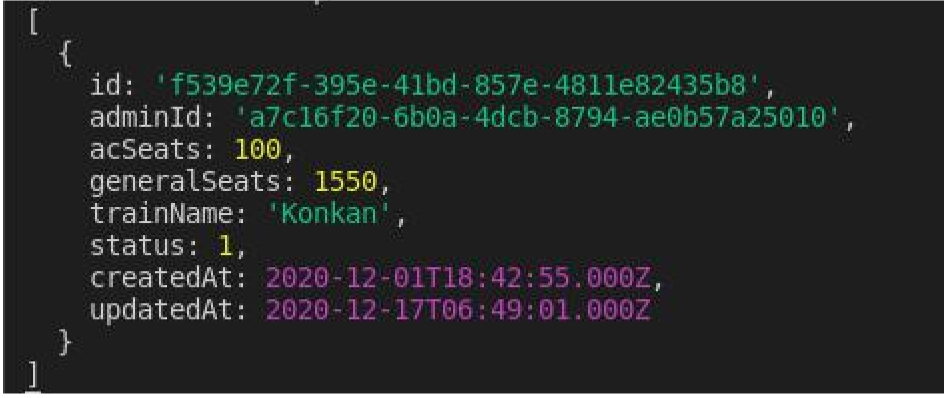


```
[
  {
    id: '5954f0da-79c8-4fe4-9b0a-a547479d7150',
    scheduleName: 'GujratMorning',
    adminId: '7f3e433c-e5c4-4901-896e-71c8ba8240a6',
    arrival: '12:00:00',
    departure: '08:00:00',
    status: 1,
    createdAt: 2020-12-17T10:18:59.000Z,
    updatedAt: 2020-12-17T10:18:59.000Z,
    text: 'Departure : 08:00:00, Arrival : 12:00:00'
  }
]
```

5. **RouteTrain:**

a) *getTrains(routeId, scheduleId, date, count, isAC);*

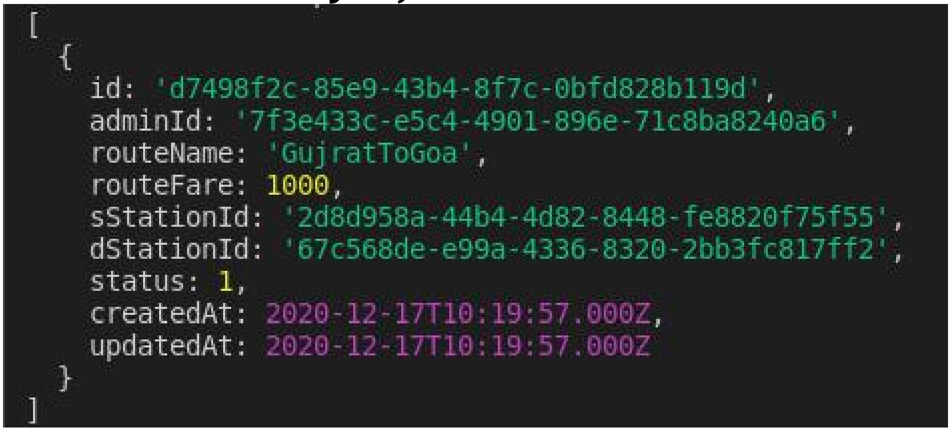
i. OUTPUT: *Array of trains.*



```
[
  {
    id: 'f539e72f-395e-41bd-857e-4811e82435b8',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    acSeats: 100,
    generalSeats: 1550,
    trainName: 'Konkan',
    status: 1,
    createdAt: 2020-12-01T18:42:55.000Z,
    updatedAt: 2020-12-17T06:49:01.000Z
  }
]
```

b) *getRoutes(trainId);*

i. OUTPUT: *Array of Routes.*

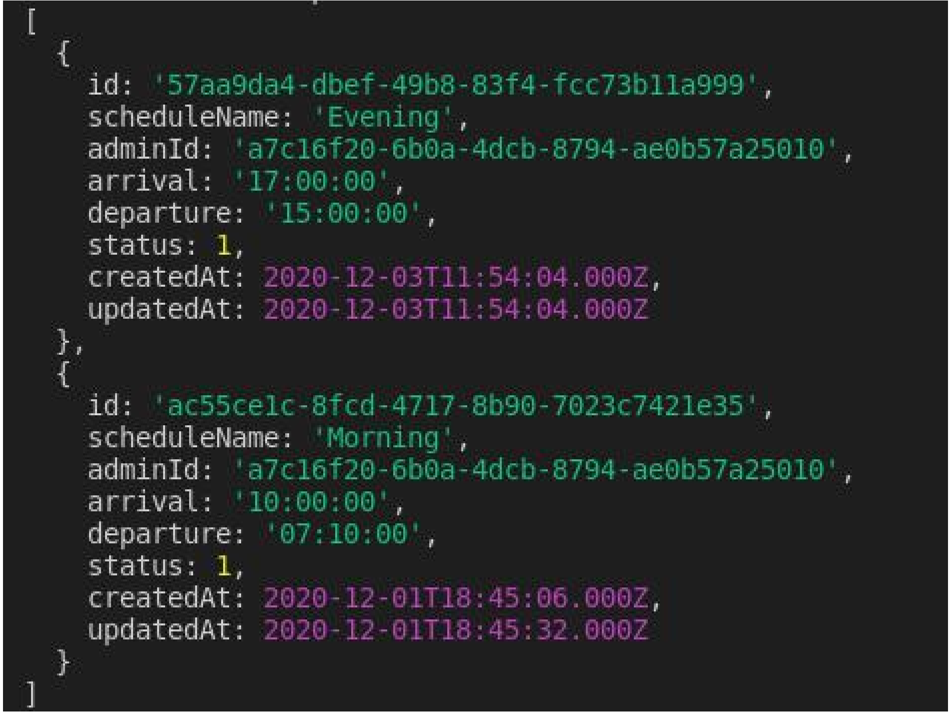


```
[
  {
    id: 'd7498f2c-85e9-43b4-8f7c-0bfd828b119d',
    adminId: '7f3e433c-e5c4-4901-896e-71c8ba8240a6',
    routeName: 'GujratToGoa',
    routeFare: 1000,
    sStationId: '2d8d958a-44b4-4d82-8448-fe8820f75f55',
    dStationId: '67c568de-e99a-4336-8320-2bb3fc817ff2',
    status: 1,
    createdAt: 2020-12-17T10:19:57.000Z,
    updatedAt: 2020-12-17T10:19:57.000Z
  }
]
```

6. **Schedules:**

a) *getSchedules(adminId);*

i. OUTPUT: *Array of Schedules;*

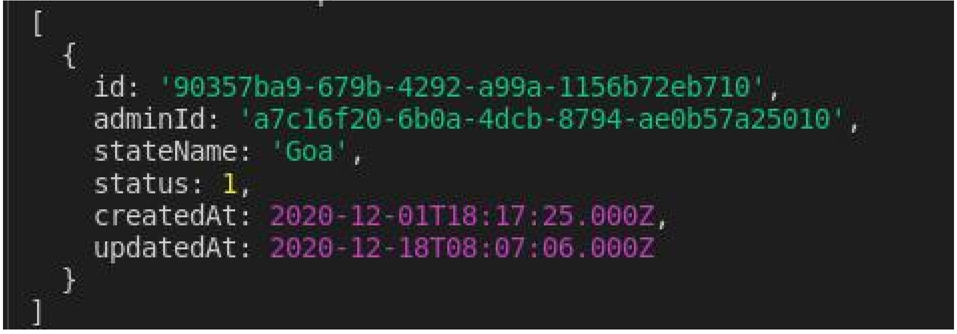


```
[
  {
    id: '57aa9da4-dbef-49b8-83f4-fcc73b11a999',
    scheduleName: 'Evening',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    arrival: '17:00:00',
    departure: '15:00:00',
    status: 1,
    createdAt: 2020-12-03T11:54:04.000Z,
    updatedAt: 2020-12-03T11:54:04.000Z
  },
  {
    id: 'ac55ce1c-8fcd-4717-8b90-7023c7421e35',
    scheduleName: 'Morning',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    arrival: '10:00:00',
    departure: '07:10:00',
    status: 1,
    createdAt: 2020-12-01T18:45:06.000Z,
    updatedAt: 2020-12-01T18:45:32.000Z
  }
]
```

7. **States:**

a) *getAllStates(adminId);*

i. OUTPUT: *Array of States*

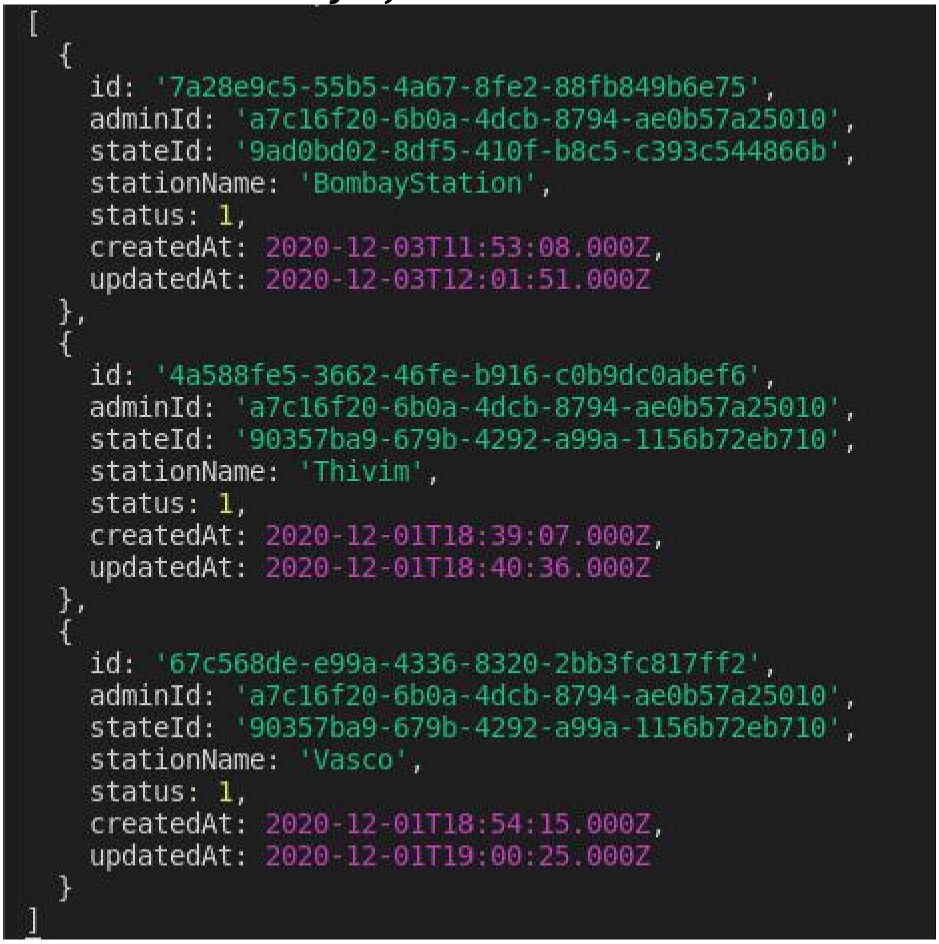


```
[
  {
    id: '90357ba9-679b-4292-a99a-1156b72eb710',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    stateName: 'Goa',
    status: 1,
    createdAt: 2020-12-01T18:17:25.000Z,
    updatedAt: 2020-12-18T08:07:06.000Z
  }
]
```

8. **Stations:**

a) *getStations(adminId);*

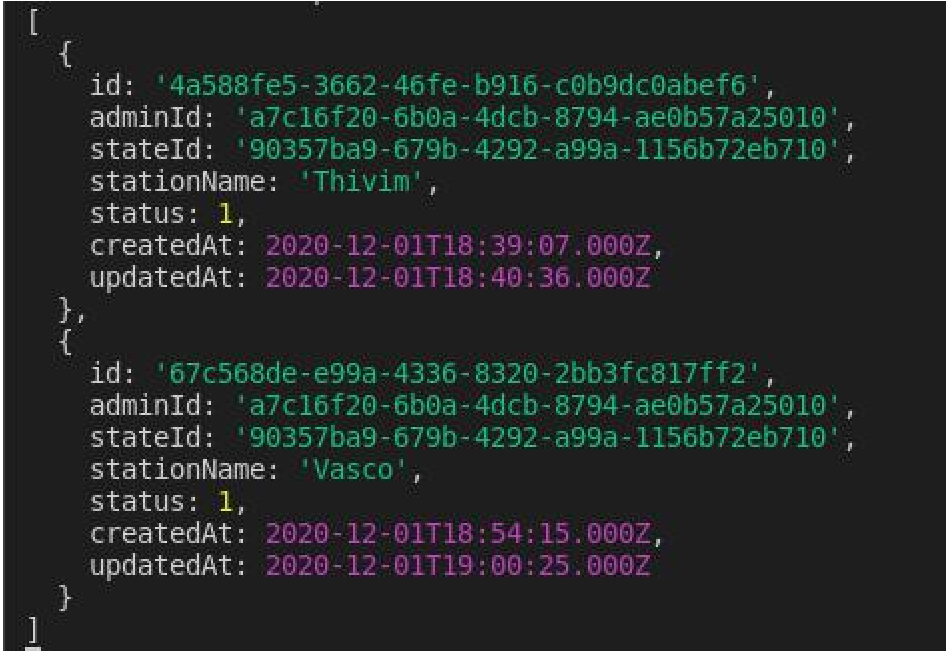
i. OUTPUT: *Array of Stations.*



```
[
  {
    id: '7a28e9c5-55b5-4a67-8fe2-88fb849b6e75',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    stateId: '9ad0bd02-8df5-410f-b8c5-c393c544866b',
    stationName: 'BombayStation',
    status: 1,
    createdAt: 2020-12-03T11:53:08.000Z,
    updatedAt: 2020-12-03T12:01:51.000Z
  },
  {
    id: '4a588fe5-3662-46fe-b916-c0b9dc0abef6',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    stateId: '90357ba9-679b-4292-a99a-1156b72eb710',
    stationName: 'Thivim',
    status: 1,
    createdAt: 2020-12-01T18:39:07.000Z,
    updatedAt: 2020-12-01T18:40:36.000Z
  },
  {
    id: '67c568de-e99a-4336-8320-2bb3fc817ff2',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    stateId: '90357ba9-679b-4292-a99a-1156b72eb710',
    stationName: 'Vasco',
    status: 1,
    createdAt: 2020-12-01T18:54:15.000Z,
    updatedAt: 2020-12-01T19:00:25.000Z
  }
]
```

b) getStateStations(stateId);

i. OUTPUT: *Array of Stations*.



```
[
  {
    id: '4a588fe5-3662-46fe-b916-c0b9dc0abef6',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    stateId: '90357ba9-679b-4292-a99a-1156b72eb710',
    stationName: 'Thivim',
    status: 1,
    createdAt: 2020-12-01T18:39:07.000Z,
    updatedAt: 2020-12-01T18:40:36.000Z
  },
  {
    id: '67c568de-e99a-4336-8320-2bb3fc817ff2',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    stateId: '90357ba9-679b-4292-a99a-1156b72eb710',
    stationName: 'Vasco',
    status: 1,
    createdAt: 2020-12-01T18:54:15.000Z,
    updatedAt: 2020-12-01T19:00:25.000Z
  }
]
```

9. **Tickets:**

a) *bookTickets(tickets);*

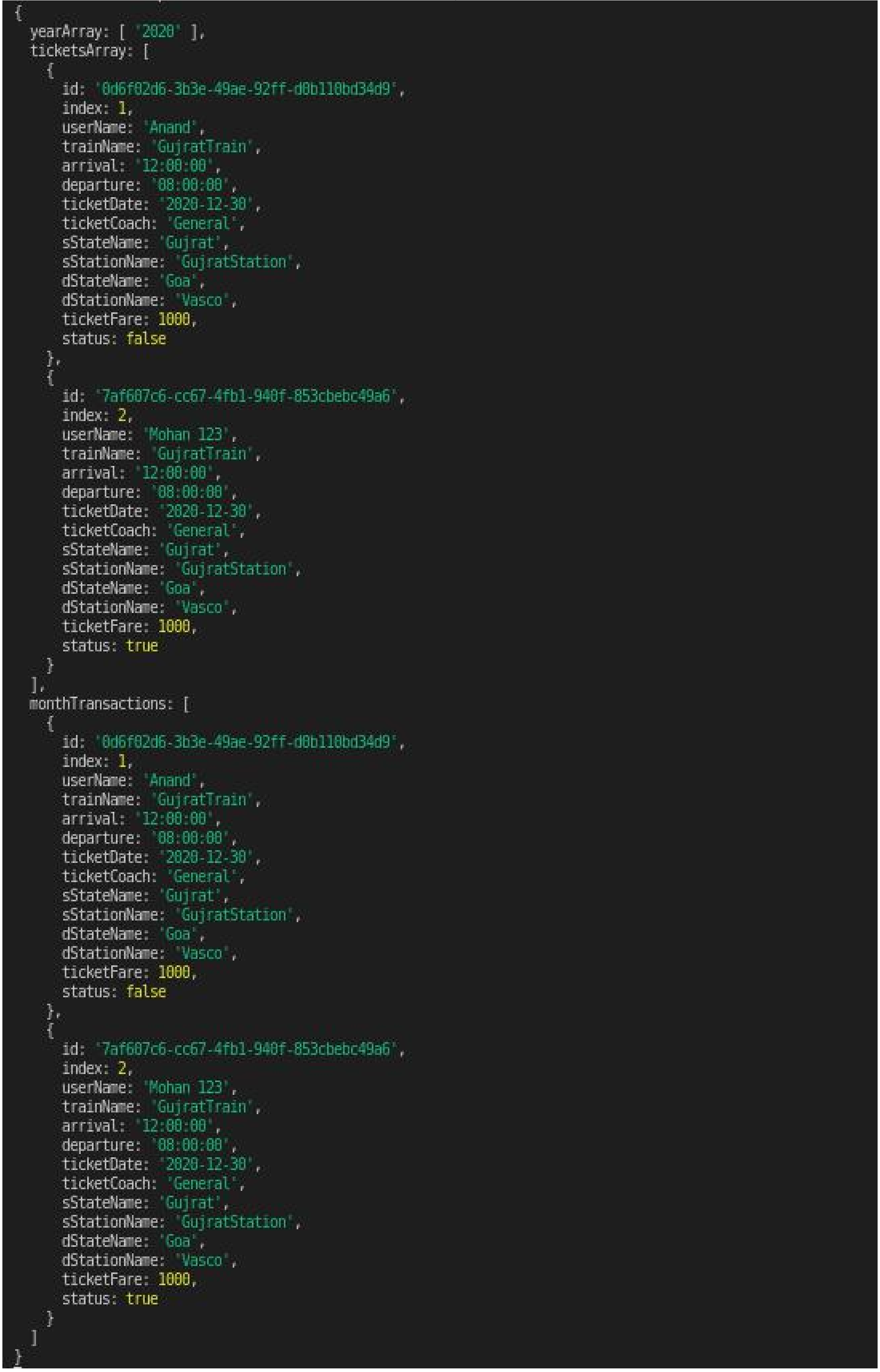
i. OUTPUT: *void*.

b) *cancelTicket(ticketId);*

i. OUTPUT: *void*.

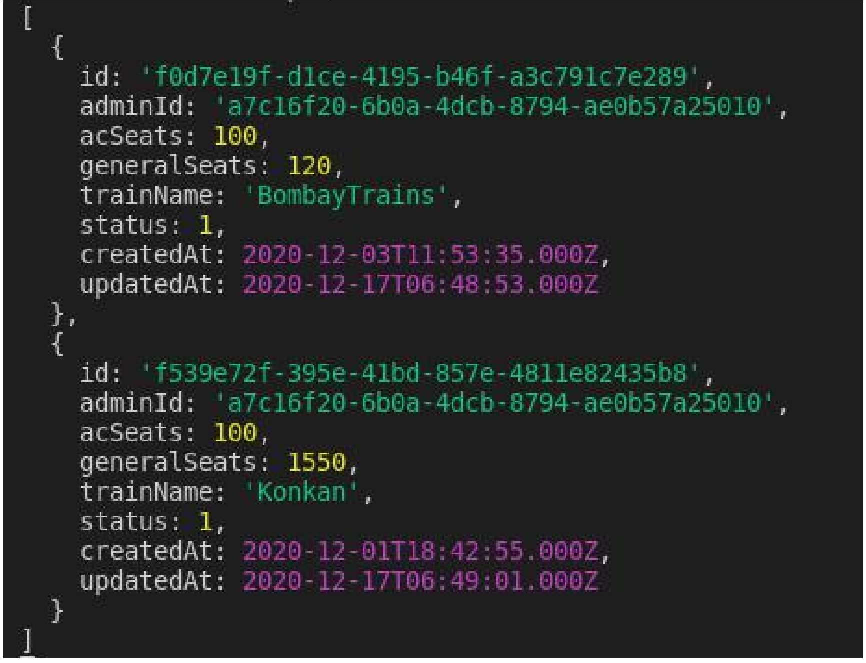
c) *getTickets(adminIs, ifAll, ticketId, date);*

i. OUTPUT: Object of yearArray, ticketArray and thisMonthTransactionsArray.



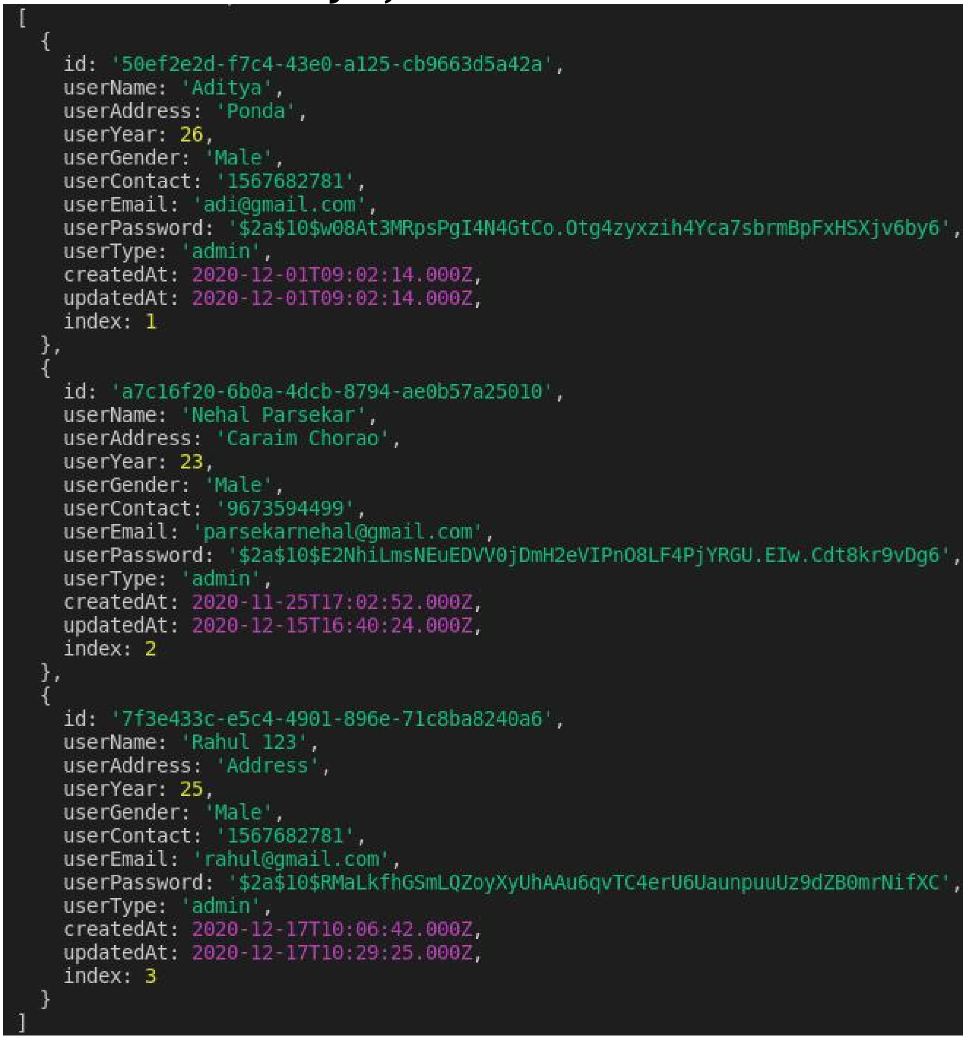
```
{
  yearArray: [ '2020' ],
  ticketsArray: [
    {
      id: '0d6f02d6-3b3e-49ae-92ff-d0b110bd34d9',
      index: 1,
      userName: 'Anand',
      trainName: 'GujratTrain',
      arrival: '12:00:00',
      departure: '08:00:00',
      ticketDate: '2020-12-30',
      ticketCoach: 'General',
      sStateName: 'Gujrat',
      sStationName: 'GujratStation',
      dStateName: 'Goa',
      dStationName: 'Vasco',
      ticketFare: 1000,
      status: false
    },
    {
      id: '7af607c6-cc67-4fb1-940f-853cbebc49a6',
      index: 2,
      userName: 'Mohan 123',
      trainName: 'GujratTrain',
      arrival: '12:00:00',
      departure: '08:00:00',
      ticketDate: '2020-12-30',
      ticketCoach: 'General',
      sStateName: 'Gujrat',
      sStationName: 'GujratStation',
      dStateName: 'Goa',
      dStationName: 'Vasco',
      ticketFare: 1000,
      status: true
    }
  ],
  monthTransactions: [
    {
      id: '0d6f02d6-3b3e-49ae-92ff-d0b110bd34d9',
      index: 1,
      userName: 'Anand',
      trainName: 'GujratTrain',
      arrival: '12:00:00',
      departure: '08:00:00',
      ticketDate: '2020-12-30',
      ticketCoach: 'General',
      sStateName: 'Gujrat',
      sStationName: 'GujratStation',
      dStateName: 'Goa',
      dStationName: 'Vasco',
      ticketFare: 1000,
      status: false
    },
    {
      id: '7af607c6-cc67-4fb1-940f-853cbebc49a6',
      index: 2,
      userName: 'Mohan 123',
      trainName: 'GujratTrain',
      arrival: '12:00:00',
      departure: '08:00:00',
      ticketDate: '2020-12-30',
      ticketCoach: 'General',
      sStateName: 'Gujrat',
      sStationName: 'GujratStation',
      dStateName: 'Goa',
      dStationName: 'Vasco',
      ticketFare: 1000,
      status: true
    }
  ]
}
```

10. **Trains:**
   a) *getTrains(adminId);*
      i. OUTPUT: *Array of Trains.*



```
[
  {
    id: 'f0d7e19f-d1ce-4195-b46f-a3c791c7e289',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    acSeats: 100,
    generalSeats: 120,
    trainName: 'BombayTrains',
    status: 1,
    createdAt: 2020-12-03T11:53:35.000Z,
    updatedAt: 2020-12-17T06:48:53.000Z
  },
  {
    id: 'f539e72f-395e-41bd-857e-4811e82435b8',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    acSeats: 100,
    generalSeats: 1550,
    trainName: 'Konkan',
    status: 1,
    createdAt: 2020-12-01T18:42:55.000Z,
    updatedAt: 2020-12-17T06:49:01.000Z
  }
]
```

11. **Users:**
   a) *getAllUUers(userType);*
      i. OUTPUT: *Array of Users.*



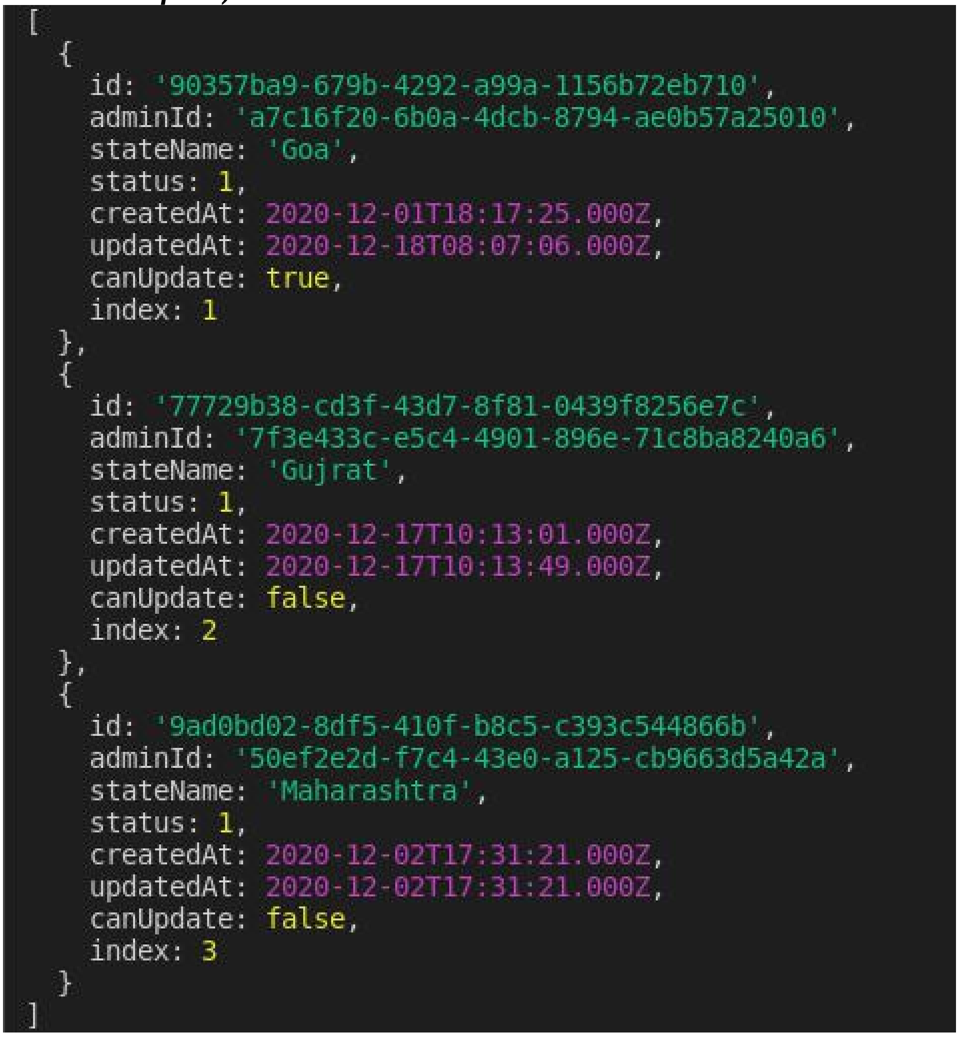
```
[
  {
    id: '50ef2e2d-f7c4-43e0-a125-cb9663d5a42a',
    userName: 'Aditya',
    userAddress: 'Ponda',
    userYear: 26,
    userGender: 'Male',
    userContact: '1567682781',
    userEmail: 'adi@gmail.com',
    userPassword: '$2a$10$w08At3MRpsPgI4N4GtCo.Otg4zyxzih4Yca7sbrmBpFxHSXjv6by6',
    userType: 'admin',
    createdAt: 2020-12-01T09:02:14.000Z,
    updatedAt: 2020-12-01T09:02:14.000Z,
    index: 1
  },
  {
    id: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    userName: 'Nehal Parsekar',
    userAddress: 'Caraim Chorao',
    userYear: 23,
    userGender: 'Male',
    userContact: '9673594499',
    userEmail: 'parsekarnehal@gmail.com',
    userPassword: '$2a$10$E2NhiLmsNEuEDVV0jDmH2eVIPnO8LF4PjYRGU.EIw.Cdt8kr9vDg6',
    userType: 'admin',
    createdAt: 2020-11-25T17:02:52.000Z,
    updatedAt: 2020-12-15T16:40:24.000Z,
    index: 2
  },
  {
    id: '7f3e433c-e5c4-4901-896e-71c8ba8240a6',
    userName: 'Rahul 123',
    userAddress: 'Address',
    userYear: 25,
    userGender: 'Male',
    userContact: '1567682781',
    userEmail: 'rahul@gmail.com',
    userPassword: '$2a$10$RMaLkfhGSmLQZoyXyUhAAu6qvTC4erU6UaunpuuUz9dZB0mrNifXC',
    userType: 'admin',
    createdAt: 2020-12-17T10:06:42.000Z,
    updatedAt: 2020-12-17T10:29:25.000Z,
    index: 3
  }
]
```

b) *updateUser(userId, userName, userAddress, userYear, userContact);*
    i. OUTPUT: *void.*

c) *updatePassword(userId, oldPassword, newPassword);*
    i. OUTPUT: *void.*

12. **Common Functions:**

a) *findAllinArray(model, nameColumn, extras, adminId);*
    i. OUTPUT: *Array of the all entries of the model(States for example).*



```
[
  {
    id: '90357ba9-679b-4292-a99a-1156b72eb710',
    adminId: 'a7c16f20-6b0a-4dcb-8794-ae0b57a25010',
    stateName: 'Goa',
    status: 1,
    createdAt: 2020-12-01T18:17:25.000Z,
    updatedAt: 2020-12-18T08:07:06.000Z,
    canUpdate: true,
    index: 1
  },
  {
    id: '77729b38-cd3f-43d7-8f81-0439f8256e7c',
    adminId: '7f3e433c-e5c4-4901-896e-71c8ba8240a6',
    stateName: 'Gujrat',
    status: 1,
    createdAt: 2020-12-17T10:13:01.000Z,
    updatedAt: 2020-12-17T10:13:49.000Z,
    canUpdate: false,
    index: 2
  },
  {
    id: '9ad0bd02-8df5-410f-b8c5-c393c544866b',
    adminId: '50ef2e2d-f7c4-43e0-a125-cb9663d5a42a',
    stateName: 'Maharashtra',
    status: 1,
    createdAt: 2020-12-02T17:31:21.000Z,
    updatedAt: 2020-12-02T17:31:21.000Z,
    canUpdate: false,
    index: 3
  }
]
```

b) *findOneAndCreate(model, columnName, name, modelObject, requestObject, responseObject, redirectPath, messages);*
    i. OUTPUT: *Creates a new entry of the model. void.*

c) *changeStatus(model, id);*
    i. OUTPUT: *Changes the status value. void.*

d) *convertToPdf(pdfTemplate, dataArray, userId, ifLandscape);*
    i. OUTPUT: *Creates a pdf in static folder. void.*

e) *sendPdf(requestObject, responseObject);*
    i. OUTPUT: *sends the pdf from static folder. void.*

RESULT

Using the application users will be able to generate different reports with the data available and inserted by the admin. With the data the users will be able to:

- Generate a document of the tickets booked.
- View transactions and generate a document of the transactions.

On the other side, Admin will be able to generate reports of:

- Users
- Train Bookings