



# DBMS Project Flight Ticket Booking and Management Portal

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# Tech Stack Used

MySQL Database

Node.js, Express

React.js, Material UI

Git

Database connection established and managed using *mysql2* package

# Core Functionalities

- Authentication (signup/login) and authorization (multiple roles viz. Customer, Admin and Super-Admin)
- Customer
  - View flights between a source and destination for a given date and a window around it
  - Reserve seat(s) each with a unique id and corresponding passenger details using a seat map for the chosen flight
  - A ticket will be generated after payment of the fare which is calculated dynamically based on the travel distance, seat preference, profession of the customer and time gap between booking date and departure date
  - Customers can view tickets categorized into two categories namely, *Upcoming Journeys* and *Archive*
  - Download tickets as dynamically generated PDFs
  - Cancel a ticket and receive appropriate refund based on the time gap between cancellation and departure date
  - View and edit their personal details from their profiles
- Admin
  - Admins have additional permissions to view the enterprise data which includes details about flight routes, their weekly schedules
- Super-Admin
  - Super-Admins have extra privileges that allow them to edit (and read) the enterprise data
  - Can delay or cancel a flight for a certain date
  - Can add new flight routes and schedules along with extending the lease date for a certain flight

# Additional Features

- As the airline is multinational, the issues that arise due to difference in time zones are taken care of using various built-in and custom functions
- Every change in the database goes through a rigorous check in frontend, backend and the database itself to ensure that the records are error free
- Ticket fares are calculated dynamically based on travel distance, seat preference, profession of the customer and time gap between booking date and departure date
- A record of all flights scheduled in the upcoming 56 days is stored and updated regularly
- A seat can be booked again after cancellation by the current holder
- Confidential information of the customer is hashed and encrypted before storing in the database
- All API endpoints and client routes are protected and authorized
- Session persistence implemented using authentication tokens
- The user interface is responsive and mobile first

TICKET		
TICKET_ID	INT	PRIMARY KEY, AUTO_INCREMENT
FLIGHT_DATE_ID	INT	NOT NULL, FK
CUSTOMER_ID	VARCHAR(20)	NOT NULL, FK
PASSENGER_NAME	VARCHAR(30)	NOT NULL
PASSENGER_AGE	INT	NOT NULL
TIME_OF_BOOKING	DATETIME	NOT NULL
FARE	INT	NOT NULL
ROW_NUM	INT	NOT NULL
COL_NUM	INT	NOT NULL
STATUS	ENUM	NOT NULL
TIME_OF_CANCELLATION	DATETIME	-
REIMBURSED_AMOUNT	INT	-

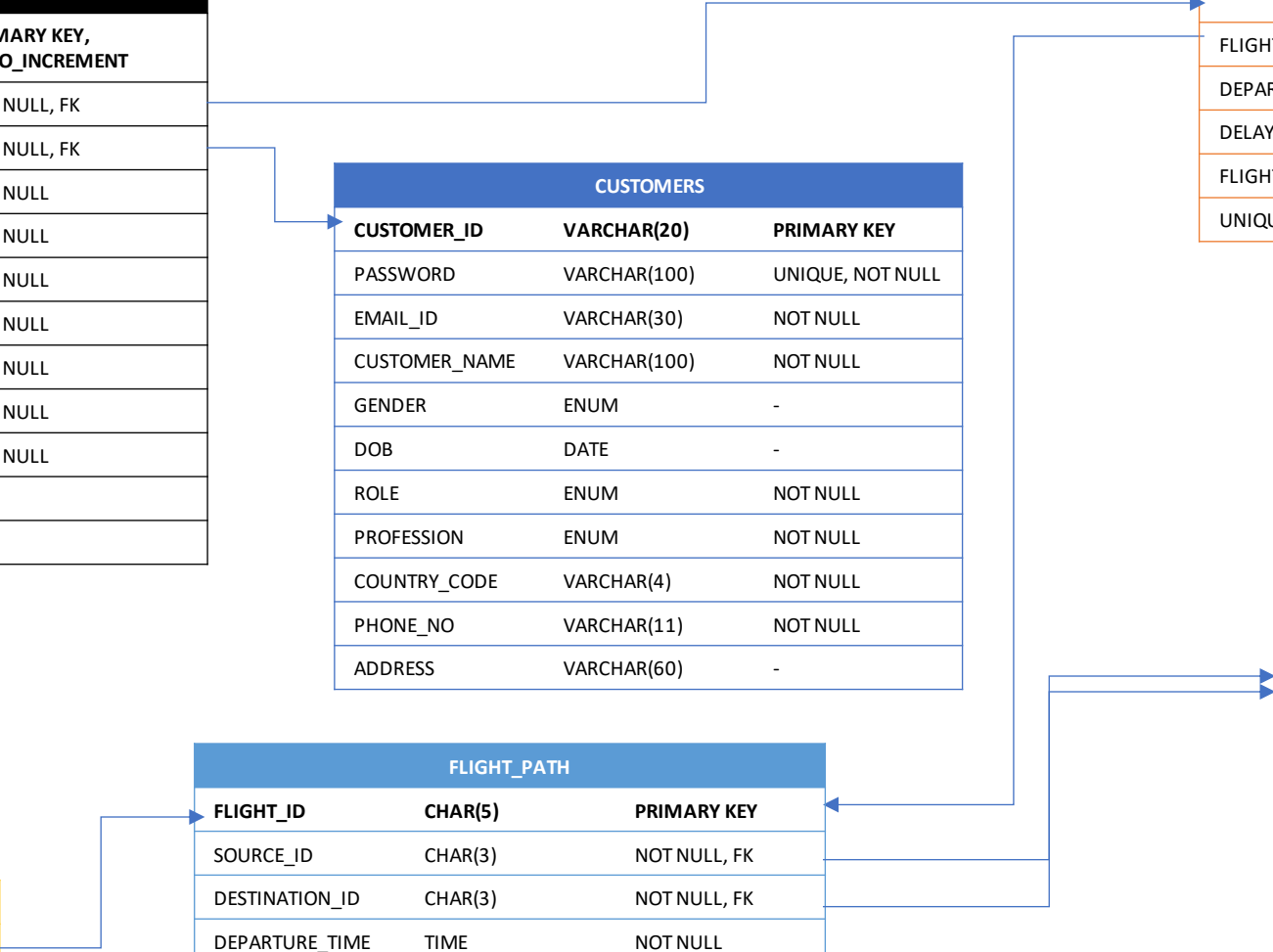
CUSTOMERS		
CUSTOMER_ID	VARCHAR(20)	PRIMARY KEY
PASSWORD	VARCHAR(100)	UNIQUE, NOT NULL
EMAIL_ID	VARCHAR(30)	NOT NULL
CUSTOMER_NAME	VARCHAR(100)	NOT NULL
GENDER	ENUM	-
DOB	DATE	-
ROLE	ENUM	NOT NULL
PROFESSION	ENUM	NOT NULL
COUNTRY_CODE	VARCHAR(4)	NOT NULL
PHONE_NO	VARCHAR(11)	NOT NULL
ADDRESS	VARCHAR(60)	-

FLIGHT_DATE		
FLIGHT_DATE_ID	INT	PRIMARY KEY, AUTO_INCREMENT
FLIGHT_ID	CHAR(5)	NOT NULL, FK
DEPARTURE_DATE	DATE	NOT NULL
DELAYED_BY	TIME	NOT NULL
FLIGHT_STATUS	ENUM	NOT NULL
UNIQUE (FLIGHT_ID, DEPARTURE_DATE)		

FLIGHT_DAY		
FLIGHT_ID	CHAR(5)	NOT NULL, FK
DAY_OF_WEEK	ENUM	NOT NULL
PRIMARY KEY (FLIGHT_ID, DAY_OF_WEEK)		

FLIGHT_PATH		
FLIGHT_ID	CHAR(5)	PRIMARY KEY
SOURCE_ID	CHAR(3)	NOT NULL, FK
DESTINATION_ID	CHAR(3)	NOT NULL, FK
DEPARTURE_TIME	TIME	NOT NULL
DURATION	TIME	NOT NULL
NUM_ROWS	INT	NOT NULL
NUM_COLS	INT	NOT NULL
BASE_FARE	INT	NOT NULL
LEASE_EXPIRY	DATE	NOT NULL

AIRPORT		
AIRPORT_ID	CHAR(3)	PRIMARY KEY
AIRPORT_NAME	VARCHAR(80)	NOT NULL
CITY	VARCHAR(20)	NOT NULL
COUNTRY	VARCHAR(20)	NOT NULL
OFFSET	TIME	NOT NULL
UNIQUE (CITY, COUNTRY)		



## STORED OBJECTS

DAILY_RECUR	Populates entries in FLIGHT_DATE table and deletes old entries from FLIGHT_PATH
CHANGE_LEASE_DATE_FLIGHT_PATH	Changes lease date for a flight ID
CHANGE_DAY_OF_WEEK_FLIGHT_DAY	Adds new days of week for a flight ID
CALCULATE_TICKET_PRICE	Based on seat position, profession of customer, number of days between booking and departure etc
CALCULATE_REIMBURSEMENT	Based on time of cancellation
SHOW_FLIGHTS	All flights between given source and destination airports for a time-window of 7 days
CONCATENATE_FLIGHT_DAYS	Returns the days of week, a flight is flying in a boolean string format
SHOW_FLIGHT_PATH_FOR_ADMIN	All flights in the database
ADD_FLIGHT_PATH_FOR_ADMIN	Add new flight between two airports with necessary details
ADD_AIRPORT	Checks data validity for a new airport before inserting in the database
BOOK_TICKET	Checks data validity for a new ticket before inserting in the database
CANCEL_TICKET	Cancels ticket, and calculates reimbursement
SHOW_TICKETS_BY_CUSTOMER_ID	All tickets booked by a customer, accepts a parameter to return upcoming or past tickets
SHOW_TICKETS_BY_TICKET_ID	Ticket details for a given ticket ID
CANCEL_FLIGHT_DATE	Cancel Flight for a given flight ID and date of departure
DELAY_FLIGHT_DATE	Delay Flight for a given flight ID and date of departure
ADD_FLIGHT_DATE_LOOP	Populates the FLIGHT_DATA table with flights flying for next two months

