



SOFTWARE REQUIREMENTS AND ERD

AIRLINE MANAGEMENT SYSTEM



**MADE BY :
ALI RAZA**

Functional Requirements:

User Management

- The system will have a separate login for Admin and Customers. Each user will enter his own credentials to access the system
- The system will implement two views, where Admins will have access to flight management and reporting features, while Customers will only be able to access booking and flight schedule features.

Flight Management (Admin)

- The Admin will have the control to add new flights to the system, providing details such as flight number, origin, destination, date, time, available seats, and prices and other details
- Admins will be able to view all flights
- The system will allow Admins to edit or delete or update flight

Ticket Booking (Customer)

- Customers will be able to search for available flights .
- Once a flight is selected, customers can book tickets by choosing their category once it is done they will be given unique no as identifiers of their seat
- Customers will have the option to cancel their bookings.

Basic Reporting (Admin)

- Admins will be able to view basic reports that provide details about bookings, including the total number of bookings per flight and other information

Non-Functional Requirements

Performance

- The system should handle at least 10 concurrent users without performance degradation.
- Ticket bookings should be processed within 2 seconds.

Security

- Use Django's authentication system for secure login.
- Ensure sensitive data like passwords are encrypted.

Usability

- Provide a clean and intuitive user interface.
- Use responsive design for accessibility on desktop and mobile.

Scalability

- The system should allow for future extensions like payment integration or advanced reporting.

ERD DIAGRAM :

1. User

○ **Attributes:**

- user_id (Primary Key)
- username
- password (encrypted)
- role (admin/customer)
- email
- first_name
- last_name
- phone_number
- date_joined

2. Flight

○ **Attributes:**

- flight_id (Primary Key)
- flight_number
- origin
- destination

- departure_date
- departure_time
- available_seats
- fare
- status (active/inactive)

3. Booking

○ Attributes:

- booking_id (Primary Key)
- pnr (Passenger Name Record)
- user_id (Foreign Key, referencing User)
- flight_id (Foreign Key, referencing Flight)
- booking_date
- seat_number
- status (booked/canceled)

4. Payment (if implemented in future)

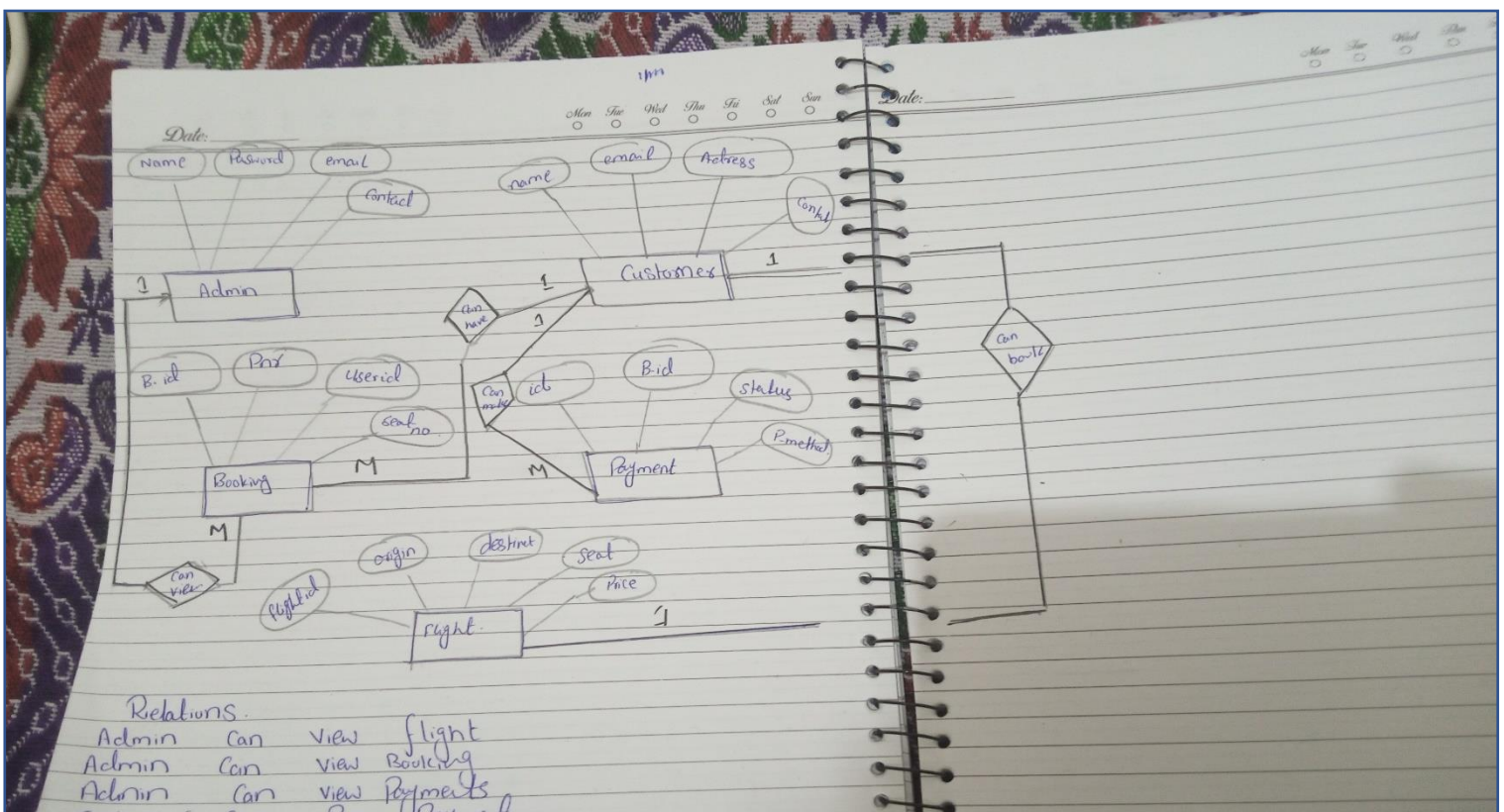
○ Attributes:

- payment_id (Primary Key)
- booking_id (Foreign Key, referencing Booking)
- payment_date
- amount
- payment_status (paid/pending)
- payment_method (credit/debit card, etc.)

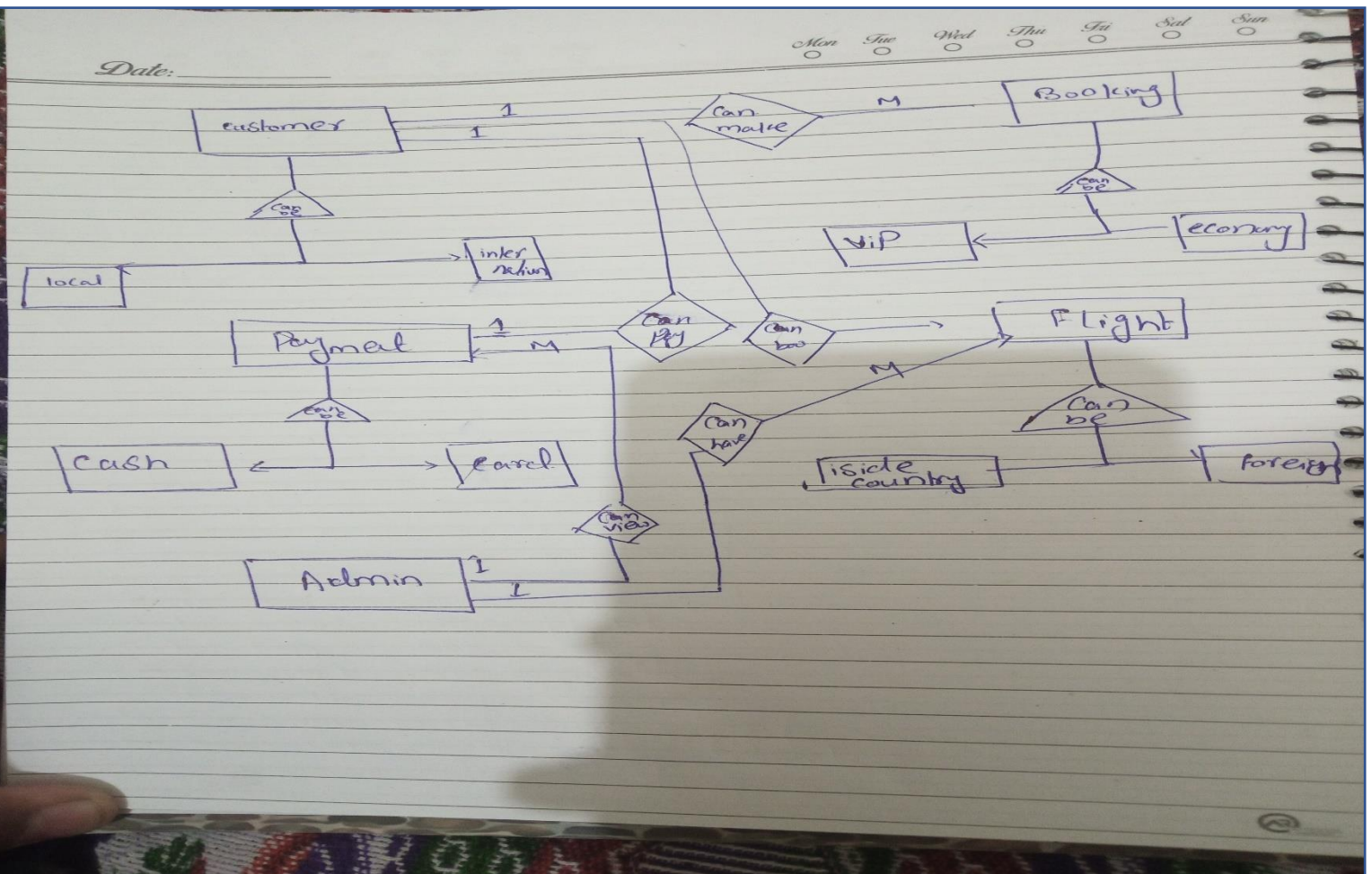
5. Admin (This can be a subset of User, but if separated, it's its own entity)

○ Attributes:

- admin_id (Primary Key)
- user_id (Foreign Key, referencing User)
- permissions (e.g., flight management, report generation)



ENHANCED ERD



RELATIONAL SCHEMA

1. Users Table

This table will store information about both Admins and Customers.

Attribute	Data Type	Description
user_id	INT	Primary Key, Unique identifier for each user
username	VARCHAR	Username for login
password	VARCHAR	Encrypted password
role	ENUM	Role of the user (Admin, Customer)
email	VARCHAR	User's email address
created_at	TIMESTAMP	Date and time when the user was created
updated_at	TIMESTAMP	Date and time when the user information was last updated

2. Flights Table

This table will store details about available flights.

Attribute	Data Type	Description
flight_id	INT	Primary Key, Unique identifier for each flight
flight_number	VARCHAR	Unique flight number
origin	VARCHAR	Origin city of the flight
destination	VARCHAR	Destination city of the flight
date	DATE	Date of the flight
time	TIME	Time of departure
available_seats	INT	Number of available seats on the flight
fare	DECIMAL	Price of the flight ticket

3. Bookings Table

This table will store booking information for customers.

Attribute	Data Type	Description
booking_id	INT	Primary Key, Unique identifier for each booking
user_id	INT	Foreign Key from Users (Customer)
flight_id	INT	Foreign Key from Flights
pnr	VARCHAR	Unique Passenger Name Record
seat_number	VARCHAR	Seat number chosen by the customer
booking_status	ENUM	Booking status (Confirmed, Canceled)
created_at	TIMESTAMP	Date and time when the booking was made

4. Flight Reports Table

This table will store flight reports related to bookings, available seats, and cancellations.

Attribute	Data Type	Description
report_id	INT	Primary Key, Unique identifier for the report
flight_id	INT	Foreign Key from Flights
total_bookings	INT	Total number of bookings for the flight
available_seats	INT	Number of available seats on the flight
cancellations	INT	Number of cancellations for the flight
report_date	DATE	Date of the report