Creating an ER diagram for a ticket management system (Airplane, F1, Cinema)

Functions and use cases of the ticket management system:

1. Ticket Booking: Users can book tickets for events (airplane tickets, F1 races, cinema tickets) for themselves and/or others.
1.1 User Selection: Users start by browsing through a list of available events, which can include flights, F1 races, or movie showtimes. They can select the event they are interested in attending.
1.2 Ticket Type Selection: Once the user selects an event, they are presented with options for different types of tickets. For example, in the case of a flight, this could include options like economy class, business class, or first class. In the context of F1 races, they might have choices for different grandstand locations. For cinema tickets, it could involve selecting the type of seat or ticket (e.g., regular, VIP, student, child).
1.3 Quantity and Reservation: Users can specify the quantity of tickets they want to book and provide the necessary information, including the names of individuals for whom they are booking the tickets. This may involve booking multiple tickets for themselves and/or others, like friends or family members.
1.4 Seat Selection (if applicable): In some cases, users may need to select specific seats or seat preferences. This is common for cinema tickets or events with assigned seating, such as theaters or sports events.
1.5 Reservation Confirmation: After making their selections, users review the booking details, including the total cost, and confirm the reservation. This step often includes providing contact information and payment details for verification and confirmation.
1.6 Payment Processing: Users make payment for the reserved tickets. The system may support various payment methods, such as credit cards, debit cards, or digital wallets.
1.7 Booking Confirmation: Once the payment is successfully processed, users receive a booking confirmation. This typically includes a confirmation number, an e-ticket, or a QR code that they can use for entry to the event.
1.8 Reservation Management: Users can access their reservation details, make changes, or cancel reservations if necessary.
1.9 Notification: The system may also send email or SMS notifications to users with event details, reservation confirmation, and instructions for event attendance.

2. Ticket Purchase: Users can purchase reserved tickets and make payments.

2.1 Selection of Reserved Tickets: Users with reserved tickets can proceed to the purchase process. These reserved tickets may have been reserved by the users themselves or by others.
2.2 Confirmation of Reservation: The user logs into the system and views their list of reserved tickets. They select the tickets they want to purchase and proceed to the purchase process.
2.3 Payment: During the purchase process, the user provides payment information. This may include entering credit card information, debit card details, or using a digital wallet to pay for the selected tickets.

purchase confirmation to the user. This may include an electronic receipt or transaction confirmation.
2.5 Updating Ticket Status: Upon completion of the purchase, the status of the tickets changes from "Reserved" to "Sold." This ensures that the tickets are no longer available for reservation or purchase by other users.
2.6 Electronic Tickets: For events that use electronic tickets, the user can download or receive an electronic ticket on their device. This could be in the form of a PDF ticket, a QR code, or another electronic ticket format.
2.7 Notification: The system sends a purchase notification to the user's email address and/or via SMS with details of the purchase and event information.
2.8 Purchase History: Users can access their purchase history, review purchase details, download electronic tickets again, or print them as needed.

3. Viewing Events and Ticket Availability: Users can view information about events, ticket availability, prices, and showtimes.

3.1 Event Browsing: Users can start by browsing a list of upcoming events in the system. These events could include airplane flights, F1 races, cinema screenings, and more. They can filter events by date, location, type, or other relevant criteria.
3.2 Event Details: Users can click on a specific event to view more details. This typically includes event name, date, time, location, a brief description, and any special features or attractions associated with the event.
3.3 Ticket Information: For each event, users can see the availability of different types of tickets, along with their prices. This may include details about ticket categories, such as economy, business, or first class for flights, various seating sections for F1 races, or seat types for cinema showings (e.g., standard, VIP, or premium).
3.4 Seat Selection (if applicable): In cases where events have assigned seating, users can select specific seats or indicate their seating preferences. They may view a seating chart and choose seats accordingly.
3.5 Availability Status: The system displays the availability status for each ticket type, indicating the number of available tickets or the number already sold or reserved.
3.6 Showtimes (for cinema): In the case of cinema tickets, users can view the showtimes for different movie screenings. This information includes the movie title, start times, and available seats for each showtime.
3.7 Real-time Updates: The system provides real-time updates on ticket availability, ensuring that users have the latest information on which tickets are still available.
user's preferences or past bookings, helping users discover new events they might be interested in.
3.9 Pricing Details: Users can review the pricing details for each ticket type, including any discounts, promotions, or additional charges. This helps users make informed decisions.
3.10 Reviews and Ratings: For some events, the system may display user reviews and ratings, allowing users to gauge the quality and popularity of the event.
3.11 Wishlist or Favorites: Users can add events to their wishlist or favorites, making it easier to track events they are interested in but not yet ready to book.

4. Event Management: System administrators can add, edit, and delete events.

4.1 Event Creation: System administrators have the capability to create new events within the system. This involves entering essential event details, including the event name, date, time, location, and any other relevant information such as descriptions, event categories, and special features.
4.2 Editing Event Information: Administrators can modify existing event information when necessary. This includes updating event dates, times, locations, descriptions, ticket types, and any changes that need to be reflected.
4.3 Event Deletion: In certain cases, administrators can remove events from the system. This is typically done for events that have been canceled, rescheduled, or are no longer relevant. Deletion ensures that these events are no longer displayed to users.
4.4 Setting Ticket Types and Prices: Administrators can define the types of tickets available for an event, such as standard, VIP, or premium tickets. They can also set prices for each ticket type and specify any discounts or promotions.
4.5 Ticket Availability: Admins can manage the availability of tickets for each event. They can monitor the number of tickets sold, reserved, and the remaining available tickets for sale.
4.6 Publishing Events: Once an event is created or updated, administrators can publish it, making it visible to users who are browsing events. Conversely, events that are not yet ready for public viewing can be kept in a draft or unpublished state.
allows the same event to be held multiple times, each with its own date, time, and ticket availability.
include featuring events on the homepage, in newsletters, or on social media to increase event visibility.
4.9 Event Analytics: System administrators can access event analytics and reports. This data can provide insights into the popularity of events, ticket sales, and user engagement, helping in decision-making and marketing strategies.
4.10 Communication: Administrators can send notifications and updates to users regarding event changes, cancellations, or important event-related information.
4.11 Security and Access Control: Access to event management functions is typically restricted to authorized administrators. Security measures are in place to prevent unauthorized changes to event information.

Entities and their attributes:

1. Entity "**Event**":

Attributes: event_id (event identifier), event_name (event name), event_date (event date), event_location (event location), event_description (event description), event_category (event

2. Entity "**Ticket**":

Attributes: ticket_id (ticket identifier), ticket_type (ticket type), seat_number (seat number), ticket_price (ticket price), status (ticket status: reserved, sold, etc.), ticket_purchase_date (ticket purchase date), ticket_barcode (ticket barcode), ticket_notes (ticket notes).

3. Entity "**User**":

Attributes: user_id (user identifier), user_name (user name), email (email address), phone (phone number), user_address (user address), user_role (user role, e.g., regular user or administrator), user_preferences (user preferences related to events).

4. Entity "**Reservation**":

Attributes: reservation_id (reservation identifier), user_id (reference to user), event_id (reference to event), reserved_date (reservation date), reservation_status (reservation status, e.g., confirmed, awaiting payment).

5. Entity "**Payment**":

Attributes: payment_id (payment identifier), payment_date (payment date), payment_amount (payment amount), payment_method (payment method, e.g., credit card, debit card, digital wallet).

Relationships between entities:

1. Between "User" and "Reservation":

Relationship: One-to-Many
Description: One user can make multiple reservations.

2. Between "Event" and "Ticket":

Relationship: One-to-Many
Description: Multiple tickets of different types can be associated with a single event.

3. Between "Ticket" and "Reservation":

Relationship: One-to-Many
Description: One reservation can contain multiple tickets.

4. Between "User" and "Payment":

Relationship: One-to-Many
Description: One user can have multiple payment transactions.

5. Between "Ticket" and "Payment":

Relationship: Many-to-Many
Description: Multiple tickets can be associated with multiple payment transactions. This represents the purchase history and helps in tracking which tickets were paid for by each user.

6. Between "User" and "Event" (for event creation and management):

Relationship: One-to-Many
Description: Users (typically administrators) can create and manage multiple events. This relationship is useful for tracking who created each event.

7. For the "Ticket" and "Payment" relationship (Many-to-Many)

Relationship: Many-to-Many
Description: It allows tracking which tickets were paid for by each payment and which payments are associated with each ticket.