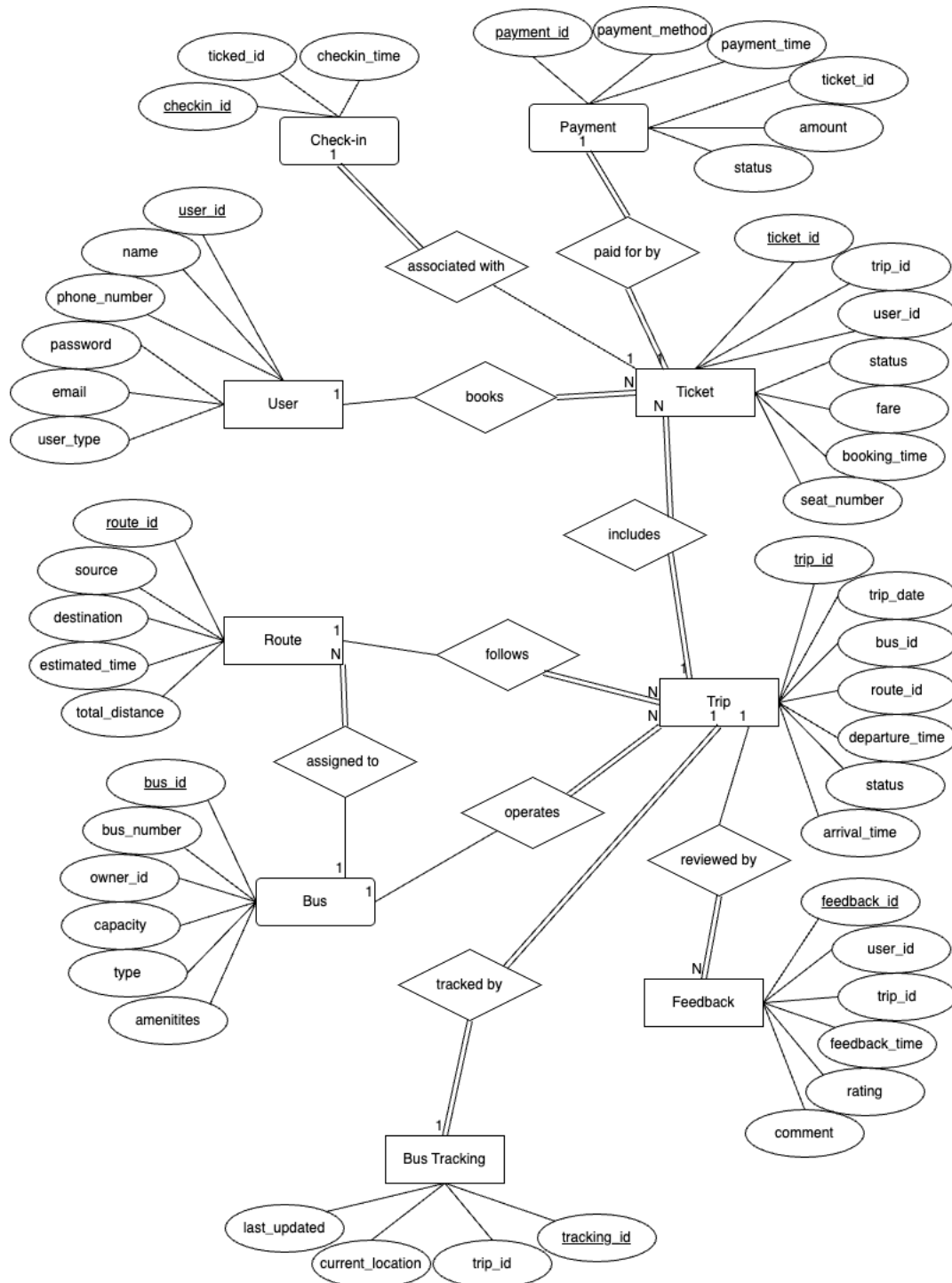# DBMS ASSIGNMENT

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Question 1:

Part B: Tool Used: **draw.io**

Entities and Attributes:

1. **User**
   - Attributes: user_id (PK), name, email, phone_number, password, user_type (passenger/owner/admin)
   - User Types:
     - **Passenger:** Books tickets
     - **Bus Owner:** Manages buses
     - **Admin:** Oversees platform functionality
2. **Bus**
   - Attributes: bus_id (PK), bus_number, type (AC/Non-AC/Sleeper), capacity, owner_id (FK), amenities
3. **Route**
   - Attributes: route_id (PK), source, destination, total_distance, estimated_time
4. **Trip**
   - Attributes: trip_id (PK), bus_id (FK), route_id (FK), trip_date, departure_time, arrival_time, status (Scheduled/Ongoing/Completed).
5. **Ticket**
   - Attributes: ticket_id (PK), trip_id (FK), user_id (FK), seat_number, booking_time, fare, status (Booked/Cancelled/Checked-in)
6. **Check-in**
   - Attributes: checkin_id (PK), ticket_id (FK), checkin_time
7. **Bus Tracking**
   - Attributes: tracking_id (PK), trip_id (FK), current_location, last_updated
8. **Payment**
   - Attributes: payment_id (PK), ticket_id (FK), payment_time, amount, payment_method, status (Successful/Failed)
9. **Feedback**
   - Attributes: feedback_id (PK), user_id (FK), trip_id (FK), rating, comment, feedback_time

Relationships:

1. **User ↔ Ticket**
   - **Relationship Name:** *Books*
   - **Description:** A user may book zero or more tickets, but every ticket is associated with exactly one user
   - **Cardinality:** 1 User (partial participation) : N Tickets (fully participating)
2. **Bus ↔ Route**
   - **Relationship Name:** *Assigned to*
   - **Description:** A bus may be assigned to one route at a time, but a route may have multiple buses assigned
   - **Cardinality:** 1 Bus (partial participation) : N Routes (fully participating)
3. **Route ↔ Trip**
   - **Relationship Name:** *Follows*
   - **Description:** A trip is always linked to one route, but a route can have multiple trips scheduled
   - **Cardinality:** 1 Route (partial participation) : N Trips (fully participating)
4. **Bus ↔ Trip**
   - **Relationship Name:** *Operates*
   - **Description:** A bus may operate for multiple trips over time, but each trip is associated with one bus
   - **Cardinality:** 1 Bus (partial participation) : N Trips (fully participating)
5. **Trip ↔ Ticket**
   - **Relationship Name:** *Includes*
   - **Description:** A trip includes multiple tickets, but every ticket is tied to one trip
   - **Cardinality:** 1 Trip (fully participating) : N Tickets (fully participating)
6. **Ticket ↔ Check-in**
   - **Relationship Name:** *Associated with*
   - **Description:** Every ticket may or may not have an associated check-in, but each check-in is tied to one ticket

- **Cardinality:** 1 Ticket (partial participation) : 1 Check-in (fully participating)

7. **Trip ↔ Bus Tracking**
   - **Relationship Name:** *Tracked by*
   - **Description:** Every trip must have one tracking record, but the tracking system only tracks active trips
   - **Cardinality:** 1 Trip (fully participating) : 1 Bus Tracking (fully participating)

8. **Ticket ↔ Payment**
   - **Relationship Name:** *Paid for by*
   - **Description:** Every ticket must have one payment, but each payment is tied to one ticket
   - **Cardinality:** 1 Ticket (fully participating) : 1 Payment (fully participating)

9. **Trip ↔ Feedback**
   - **Relationship Name:** *Reviewed by*
   - **Description:** A trip may have multiple feedback entries, but feedback must reference one specific trip
   - **Cardinality:** 1 Trip (partial participation) : N Feedback (fully participating)