International Airport Database

1. Object detection (Entities)

Based on the analysis of the system characteristics, the following main objects were identified:

- **Airport**: **Stores airport data.**
- **Flight: Stores data about flights.**
- **Airline: Stores airline data.**
- **Passenger: Stores personal data about passengers.**
- **Booking: Stores data about booking airline tickets.**
- **BoardingPass: Collects data about boarding passes issued to passengers.**
- **Baggage: Stores data about registered shipments.**
- **BaggageChecking: Stores data about the results of cargo inspection.**
- **SecurityCheck: Stores data about passenger security checks.**
- **BookingChanges: This is a separate table for storing changes made to the booking.**

2. DefiningAttributes and DataTypes (dataTypesand Data Types)

For each object, its attributes, primary keys (PK), foreign keys (FK), and data types were defined:

- **Airport**
  - airport_id (PK)
  - airport_name
  - country, state, city
- **Airline**
  - airline_id (PK)
  - airline_code (Unique)
  - name
  - country
- **Flight**
  - flight_id (PK)
  - departing_gate, arriving_gate
  - scheduled_departure_time, scheduled_arrival_time
  - actual_departure_time, actual_arrival_time
  - airline_id (FK → Airline)
  - departure_airport_id (FK → Airport)
  - arrival_airport_id (FK → Airport)
- **Passenger**
  - passenger_id (PK)
  - first_name, last_name
  - gender, date_of_birth

- passport_number (Unique)
- country_of_citizenship, country_of_residence

- **Booking**

  - booking_id (PK)
  - status, booking_platform
  - ticket_price
  - flight_id (FK → Flight)
  - passenger_id (FK → Passenger)

- **BoardingPass**

  - boarding_pass_id (PK)
  - seat, boarding_time
  - booking_id (FK → Booking)

- **Baggage**

  - baggage_id (PK)
  - weight_kg
  - booking_id (FK → Booking)

- **BookingChanges**

  - change_id (PK)
  - old_data, new_data
  - booking_id (FK → Booking)

- **SecurityCheck**

  - security_check_id (PK)
  - check_results
  - passenger_id (FK → Passenger)

3. Defining Relationships

Relationships between objects, their cardinality (cardinality), and participation restrictions:

- **Airline – Flight: one-to-many (1 : N).** One airline can operate many flights.

- **Airport – Flight (Departure): one-to-many (1 : N).** A single airport can be the departure point for multiple flights.

- **Airport – Flight (Arrival): one-to-many (1 : N).** A single airport can be the arrival point for multiple flights.

- **Flight – Booking: one-to-many (1 : N).** One flight can have many bookings.

- **Passenger – Booking: one-to-many (1 : N).** A single passenger can make multiple bookings.

- **Booking – BoardingPass: one-to-many (1 : N).** Multiple boarding passes can correspond to a single booking.

- **Booking – Baggage: one-to-many (1 : N).** Several pieces of baggage can belong to one booking.

- **Booking – BookingChanges: one-to-many (1 : N).** Many changes can be made to a single booking.

- **Passenger – SecurityCheck: one-to-many (1 : N).** One passenger can undergo several security checks.

RE_Graph: