



Laboratory Work 1: ERD Diagram

Introduction

First, I read the system description and found the main entities: Airport, Airline, Flight, Passenger, Booking, BoardingPass, Baggage, BaggageCheck, and SecurityCheck. After that, I wrote down the attributes for each entity and marked primary keys, foreign keys, and unique fields.

Then, I checked the relationships between entities. For example, one airline can have many flights, and one passenger can have many bookings. I also noticed that the relation between flights and passengers is many-to-many, so I solved it with the Booking table.

Next, I normalized the database to the third normal form. I made sure that all attributes are atomic (1NF), that they depend on the whole primary key (2NF), and that there are no transitive dependencies (3NF).

Finally, I created the ER diagram in draw.io. I added entities, attributes, and connected them with the correct relationships and cardinalities. After finishing the diagram, I wrote a short description of the design and exported everything to PDF.

Entities and Attributes

- **Airport:** airport_id (PK), airport_name, country, state, city, created_at, updated_at.
- **Flights:** flight_id (PK), airline_id (FK), departure_airport_id (FK), arrival_airport_id (FK), departure_gate, arrival_gate, scheduled_departure_time, scheduled_arrival_time, actual_departure_time, actual_arrival_time, created_at, updated_at.
- **Airlines:** airline_id (PK), airline_code, name, country, created_at, updated_at.
- **Passengers:** passenger_id (PK), first_name, last_name, gender, date_of_birth, citizenship_country, residence_country, passport_number, created_at, updated_at.
- **Bookings:** booking_id (PK), flight_id (FK), passenger_id (FK), status, booking_platform, ticket_price, created_at, updated_at.
- **Booking Change:** change_id (PK), booking_id (FK), change_details, created_at, updated_at.
- **Boarding Pass:** boarding_pass_id (PK), booking_id (FK), seat, boarding_time, created_at, updated_at.
- **Baggage:** baggage_id (PK), booking_id (FK), weight_kg, created_at, updated_at.
- **Security Check:** check_id (PK), passenger_id (FK), check_results, created_at, updated_at.
- **Checking:** checking_id (PK), booking_id (FK), passenger_id (FK), check_results, created_at, updated_at.

Legend

- | = exactly one
- O = zero (optional)
- > = many

Combinations:

- |—| = one to one (1 : 1)
- |—> = one to many (1 : N)
- O—| = zero or one (0 : 1)
- O—> = zero or many (0 : N)