



# 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)