International Airport Database ER Diagram

Course: Databases
Laboratory Work 1: ERD Diagram
Submission format: PDF document containing ER-Diagram of the system and textual description of the solution.

Airport

Attribute	Type	Constraints
airport_id	INT	Primary Key
airport_name	VARCHAR(100)	
country	VARCHAR(50)	
state	VARCHAR(50)	
city	VARCHAR(50)	
created_at	TIMESTAMP	
updated_at	TIMESTAMP	

Airline

Attribute	Type	Constraints
airline_id	INT	Primary Key
airline_code	VARCHAR(10)	Unique
name	VARCHAR(100)	
country	VARCHAR(50)	
created_at	TIMESTAMP	
updated_at	TIMESTAMP	

Flight

Attribute	Type	Constraints
flight_id	INT	Primary Key
airline_id	INT	Foreign Key (Airline)
departure_airport_id	INT	Foreign Key (Airport)
arrival_airport_id	INT	Foreign Key (Airport)
scheduled_departure	TIMESTAMP	
scheduled_arrival	TIMESTAMP	
actual_departure	TIMESTAMP	Nullable

actual_arrival	TIMESTAMP	Nullable
created_at	TIMESTAMP	
updated_at	TIMESTAMP	

Passenger

Attribute	Type	Constraints
passenger_id	INT	Primary Key
first_name	VARCHAR(50)	
last_name	VARCHAR(50)	
gender	CHAR(1)	
date_of_birth	DATE	
country_of_citizenship	VARCHAR(50)	
country_of_residence	VARCHAR(50)	
passport_number	VARCHAR(20)	Unique
created_at	TIMESTAMP	
updated_at	TIMESTAMP	

Booking

Attribute	Type	Constraints
booking_id	INT	Primary Key
flight_id	INT	Foreign Key (Flight)
passenger_id	INT	Foreign Key (Passenger)
status	VARCHAR(20)	
booking_platform	VARCHAR(50)	
ticket_price	DECIMAL(10,2)	
created_at	TIMESTAMP	
updated_at	TIMESTAMP	

Booking_Change

Attribute	Type	Constraints
change_id	INT	Primary Key
booking_id	INT	Foreign Key (Booking)
change_description	TEXT	
created_at	TIMESTAMP	

Boarding_Pass

Attribute	Type	Constraints
boarding_pass_id	INT	Primary Key
booking_id	INT	Foreign Key, Unique
seat	VARCHAR(10)	
boarding_time	TIMESTAMP	
created_at	TIMESTAMP	
updated_at	TIMESTAMP	

Baggage

Attribute	Type	Constraints
baggage_id	INT	Primary Key
booking_id	INT	Foreign Key (Booking)
weight_kg	DECIMAL(5,2)	
created_at	TIMESTAMP	
updated_at	TIMESTAMP	

Baggage_Check

Attribute	Type	Constraints
baggage_check_id	INT	Primary Key
baggage_id	INT	Foreign Key (Baggage)
check_result	VARCHAR(50)	
created_at	TIMESTAMP	
updated_at	TIMESTAMP	

Security_Check

Attribute	Type	Constraints
security_check_id	INT	Primary Key
passenger_id	INT	Foreign Key (Passenger)
check_result	VARCHAR(50)	
created_at	TIMESTAMP	
updated_at	TIMESTAMP	

Relationships

Relationship	Type	Description
Airline — Flight	One-to-Many (1:N)	One Airline operates many Flights. Each Flight is operated by
Airport — Flight (Departure)	One-to-Many (1:N)	One Airport is the origin for many departing Flights. Each Flig
Airport — Flight (Arrival)	One-to-Many (1:N)	One Airport is the destination for many arriving Flights. Each
Flight — Booking	One-to-Many (1:N)	One Flight can have many Bookings. Each Booking is for one
Passenger — Booking	One-to-Many (1:N)	One Passenger can make many Bookings. Each Booking is m
Booking — Booking_Change	One-to-Many (1:N)	One Booking can have many change records. Each change r
Booking — Boarding_Pass	One-to-One (1:1)	One Booking generates one Boarding Pass. Each Boarding P
Booking — Baggage	One-to-Many (1:N)	One Booking can have many pieces of Baggage. Each piece
Baggage — Baggage_Check	One-to-Many (1:N)	One piece of Baggage can be checked multiple times. Each c
Passenger — Security_Check	One-to-Many (1:N)	One Passenger can go through multiple Security Checks. Eac

Legend

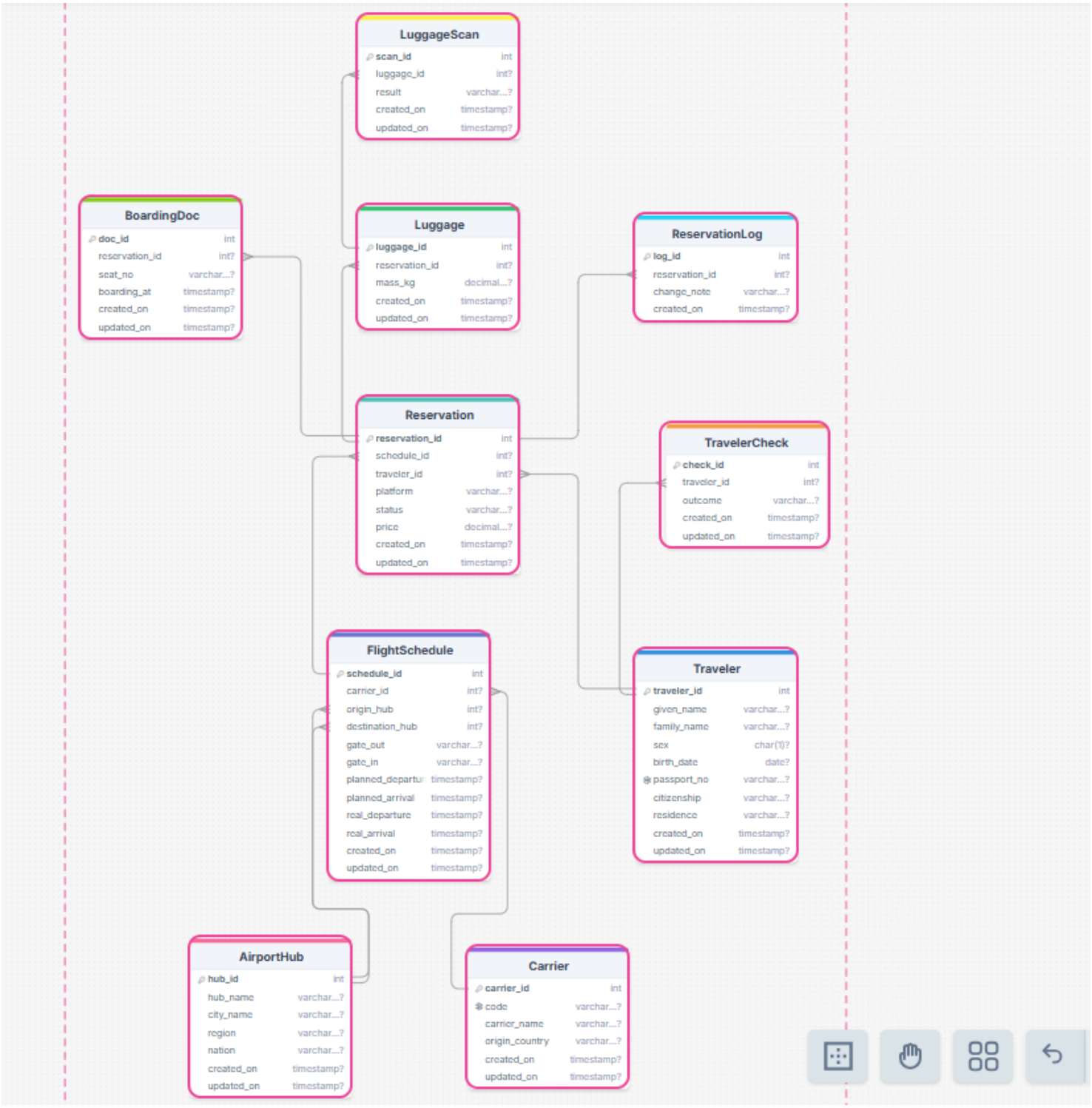
PK: Primary Key - A unique identifier for each record in the table
FK: Foreign Key - An attribute that creates a link between two tables
UK: Unique Key - An attribute that must have unique values
Relationship Notation: ||--o{ = One-to-Many (1:N), ||--|| = One-to-One (1:1) relationship

Data Types

INT: Integer number
VARCHAR(n): Text string of variable length (max n characters)
DECIMAL(p, s): Exact numeric value with p total digits and s decimal places
TIMESTAMP: Date and time value
DATE: Date value
TEXT: Long text string
CHAR(n): Fixed-length character string

Normalization

The database schema has been normalized to Third Normal Form (3NF): 1. All tables have primary keys 2. All non-key attributes are fully functionally dependent on the primary key 3. No transitive dependencies exist between non-key attributes This design ensures data integrity, minimizes redundancy, and supports efficient querying for airport operations management.


LuggageScan
scan_id int
luggage_id int?
result varchar...?
created_on timestamp?
updated_on timestamp?
BoardingDoc
doc_id int
reservation_id int?
seat_no varchar...?
boarding_at timestamp?
created_on timestamp?
updated_on timestamp?
Luggage
luggage_id int
reservation_id int?
mass_kg decimal...?
created_on timestamp?
updated_on timestamp?
ReservationLog
log_id int
reservation_id int?
change_note varchar...?
created_on timestamp?
Reservation
reservation_id int
schedule_id int?
traveler_id int?
platform varchar...?
status varchar...?
price decimal...?
created_on timestamp?
updated_on timestamp?
TravelerCheck
check_id int
traveler_id int?
outcome varchar...?
created_on timestamp?
updated_on timestamp?
FlightSchedule
schedule_id int
carrier_id int?
origin_hub int?
destination_hub int?
gate_out varchar...?
gate_in varchar...?
planned_departur timestamp?
planned_arrival timestamp?
real_departure timestamp?
real_arrival timestamp?
created_on timestamp?
updated_on timestamp?
Traveler
traveler_id int
given_name varchar...?
family_name varchar...?
sex char(1)?
birth_date date?
passport_no varchar...?
citizenship varchar...?
residence varchar...?
created_on timestamp?
updated_on timestamp?
AirportHub
hub_id int
hub_name varchar...?
city_name varchar...?
region varchar...?
nation varchar...?
created_on timestamp?
updated_on timestamp?
Carrier
carrier_id int
code varchar...?
carrier_name varchar...?
origin_country varchar...?
created_on timestamp?
updated_on timestamp?