

Flights of an Airline:

- The airline provides flights. Each flight is determined by its flight number (e.g, AC222) and the date (e.g, 17-January-2023). Further flight information is the departure airport, the arrival airport, the departure time and the arrival time.
- Passengers are determined by their name and address.
- Passengers can book flights.

Flights of an Airline (improved)

- The airline offers flight routes. A flight route is determined by its flight number (e.g., AC222). Further information is the departure and arrival airports, the departure and arrival times (e.g, from Montreal to Toronto, departure 7:10am, arrival 8:30am).
- Each flight route is flown several times per week. That is, there are many “flight instances” of a flight route, each flying on a specific date (e.g, AC222 on the 17-January 2023).
- Passengers are determined by their name and address.
- Passengers can book flights.

Planes of an Airline:

- The airline has an inventory of airplanes and the company keeps track of each individual one (because they are, e.g., assigned to flights). Each airplane belongs to a specific model (determined by its model number, e.g., A310 and the manufacturer, e.g., Airbus). A model has a capacity and a maximum speed. Models of different manufacturers could have the same model number but within one manufacturer model numbers are unique. Each airplane has a serial number. Serial numbers are unique within a model but not across models.
- For each flight the airplane to be used must be stored.

Planes of an Airline improved

- The airline keeps track of the airplane models of its fleet. Each airplane model is determined by its model number and manufacturer (e.g. A310 / Airbus). That is, models of different manufacturers could have the same model number but within one manufacturer model numbers are unique. Further attributes are the capacity and the maximum speed.
- The airline has many airplanes in its inventory. Each airplane is determined by its serial number and its model.
- For each flight the airplane to be used must be stored.

Rest of the airline

- The company has many employees. Each employee is determined by its employee number. Further information are the name, address and salary.
- A sub-group of the employees are the crew members.
- For each flight the crew members serving the flight must be stored.
- A subgroup of crew members are the pilots. Each pilot is allowed to fly specific airplane models.
- Note that certain constraints are difficult/impossible to reflect in the E/R schema such as
 - The pilot assigned to a flight must be able to fly the airplane (is allowed to fly the specific airplane model)
 - Flights may only be overbooked to a certain degree (something like capacity > 1.1 booked seats)