Requirements file for the “Flights Booking System” project

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This is the requirements file describing the structure of our project that aims to simulate a flight booking application’s database, using the knowledge gained from the course **Data Management I**, under the supervision of Professor Karima Echihabi and teaching assistants Ms. Khaoula Abdenouri and Ms Hasnae Zerouaoui.

Entities

Our environment will be divided into 7 entities:

* User,
* Passenger,
* Reservation,
* Ticket,
* FidelityCard,
* Flight,
* Airplane;

1. **Passenger Entity:**

The "Passenger" entity represents the flight boarders.

It includes essential attributes such as:

* **cin (string)[Primary Key]:** for a unique identification.
* **pfirstName (string):** to specify the first name of each passenger.
* **plastName (string):** to specify the last name of each passenger.
* **pbirthDate (integer):** to specify the passenger’s age.
* **passportID(string):** the passport ID of the passenger, it is an optional key.
* **phoneNumber(string):** the phone number of the passenger.

1. **User Entity:**

The "User" entity identifies informations about the visitor of the booking service (and who might become a Passenger):

* **uemail(string)[Primary key]**: the user’s email.
* **ufirstName (string):** to specify the first name of each user.
* **ulastName (string):** to specify the last name of each user.
* **ubirthDate (integer):** to specify the user’s age.
* **passwordHash (string)**: to store the user’s password.

1. **Ticket Entity:**

The "Ticket" entity encompasses the specific details and features associated with a passenger's ticket, including attributes like:

* **tid (string)[primary key]:** a unique identifier for the ticket.
* **seatNumber (int):** the assigned seat number for the passenger.
* **class (string):** the class or cabin category for the ticket.
* **price (float):** the price or cost associated with the ticket.

1. **FidelityCard Entity:**

The "FidelityCard" entity embodies the passenger’s service card offered when boarding a flight, with attributes such as:

* **type (string)[Primary Key]:** the type of the card (Basic, Silver, Gold or Platinum).
* **reduction (float):** to represent the reduction value.

1. **Flight Entity:**

The "Flight" entity encompasses flight information, with attributes such as:

* **fid (string)[Primary Key]:** the flight id for streamlined flight management.
* **departure (string):** the flight’s origin point.
* **destination (string):** the flight’s endpoint.
* **departureTime (datetime):** the scheduled time of flight departure.
* **arrivalTime (datetime):** the scheduled time for flight arrival.

1. **Airplane Entity:**

The “Airplane” entity encompasses all of the information needed on an airplane, with attributes such as:

* **registrationNumber (int)[Primary Key]**:represents the international identification number of the airplane.
* **airline(string):** gives out the airline to which the airplane belongs.
* **model(string):** the model of the airplane.
* **maxWeight (string):** the maximum weight capacity the airplane can hold.
* **economySeats(int):** maximum number of economy seats.
* **premiumEconomySeats (int):** maximum number of premium economy seats.
* **businessClassSeats (int) :** maximum number of business class seats.
* **firstClassSeats (int):** maximum number of first class seats.

1. **Reservation Entity:**

The “Reservation” entity represents the transaction that the “User” went with to reserve a Flight (Either to themselves or to other people). It has the following attributes:

* **rid (float)[Primary Key]**: represents the reservations’s id.
* **dateReservation (datetime):** represents the date and time the reservation was made.
* **dateConfirmation (datetime):** represents the date and time the reservation was confirmed/ paid.

Relationships

* **has:** This relationship represents the association between a "Passenger" and a "Ticket." A passenger "has" a ticket, indicating that passengers are associated with their respective tickets. A passenger has at least one ticket, and a ticket has exactly one owner or passenger.
* **benefitsFrom:** This relationship connects a "Passenger" with a "FidelityCard". Passengers benefit from fidelity cards, they may or may not possess them. It’s a many-to-many relation.
* **apply**: This relationship links "FidelityCard" and "Ticket". Passengers can "apply" fidelity cards to their tickets to enjoy benefits or discounts. It is one-to-many relationship.
* **books:** This relationship connects a "User" with a "Reservation,". Users can book 0 or many reservations, while a reservation may only be made by only one user at a time.
* **holds:** This relationship connects a “Reservation” with a “Ticket”. A reservation may hold one or many tickets at once, while each ticket is specific to only one reservation. It’s a many-to-one relationship.
* **assignedTo**: This relationship links a "Ticket" with a "Flight". It indicates that tickets are "assigned to" specific flights for travel. A ticket can reference exactly one flight, while a flight is referenced by at least one ticket.
* **checks:** This relationship connects a "User" with a "Flight". Users can check flights for availability, and get recommended new flights depending on their search. It’s a many-to-many relationship.
* **flies:** This relationship connects an "Airplane" with a "Flight". Airplanes in this model fly on specific flights. An airplane can fly on 0 to many flights, however a flight can be performed by one and only one airplane. It’s a many-to-one relationship.

Written Constraints

* For a flight not to be canceled there should be at least 10 passengers.
* ubirthdate should be greater than 18.
* The range of the reduction price is from 0 to 100%.
* The seat number is unique for each flight.
* A passenger is considered an adult (owns an identification number).
* A child (under 16 years) should be accompanied when flying.