Requirements file for the

“Airport simulation” project

Course: Data Management 1, Academic year: 2023 / 2024,

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This is a file describing the different entities, relations and attributes developed to simulate an airport environment, using our knowledge gained from the course **Data Management I** .

Our environment will be divided into 4 entities:

* User,
* Passenger,
* Flight,
* Airplane,
* Ticket,
* Child,
* PerksCard,
* Service,

1. **Passenger Entity:**

The "Passenger" entity represents the flight boarders.

It includes essential attributes such as:

* **CIN (string)[Primary Key]:** for a unique identification.
* **pFullName (string):** to specify the name of each boarder.
* **pBirthDate (integer):** to specify the passenger’s age.
* **PassportID(string):** the passport ID of the passenger, it is an optional key.
* **pPhoneNumber(string):** the phone number of the passenger.

1. **Child Entity:**

The "Child" entity represents children of passengers. It is a weak entity related to “Passenger” and it includes the following attributes:

* **cFullName (string)[Primary Key]:** This attribute specifies the full name of the child.
* **cBirthDate (integer):** It specifies the child's date of birth.

1. **User Entity:**

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

* **Email(string)[Primary key]**: the user’s email.
* **uFullName (string):** to specify the name of each user.
* **uBirthDate (integer):** to specify the user’s age.
* **PasswordHash (string)**: to store the user’s password

1. **Flight Entity:**

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

* **Departure (string):** the flight’s origin point.
* **Destination (string):** the flight’s endpoint.
* **DepartureTime (date):** the scheduled time of flight departure.
* **ArrivalTime (date):** the scheduled time for flight arrival.
* **FlightID (string)[Primary Key]:** for streamlined flight management.
* **ReservedSeats(integer):** number of booked seats. (seats that were payed for)

1. **PerksCard Entity:**

The "PerksCard" entity embodies the different perks offered when boarding a flight, with attributes such as:

* **Reduction(float):** to represent the reduction value,
* **Name (string)[Primary Key]:** the name of the service.

1. **Ticket Entity:**

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

* **TicketID (string)[primary key]:** A unique identifier for the ticket.
* **SeatNumber (INT):** The assigned seat number for the passenger.
* **Class (float):** The class or cabin category for the ticket.
* **TransactionID (string):** An identifier related to the transaction or purchase of the ticket.
* **Tprice (float):** The price or cost associated with the ticket.

1. **Airplane Entity:**

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

* **RegistrationNumber(integer)[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,
* **Seats(integer):**maximum number of passenger seats,
* **Capacity(integer):** maximum capacity of total luggages of a passenger.

1. **Service Entity:**

The “Service” entity represents all of the extra services that are related to a ticket. It is a weak entity related to “Ticket” entity. It has the following attributes:

* **Price(float):** represents the price to pay for the extra service
* **ID(float)[primary key]**: represents the service’s id

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 "Perks\_Card." Passengers "benefit from" perks cards, suggesting that passengers may possess or use perks cards. It’s a many-to-many relation between “Passenger” and “PerksCard”
* **with:** This relationship connects a "Passenger" with a "Child," which is a weak entity of the "Passenger." It indicates that a passenger can have 0-to-many children, a child on the other hand is associated with exactly one passenger.
* **apply**: This relationship links "PerksCards" and "Ticket." Passengers can "apply" perks cards to their tickets to enjoy benefits or discounts. it is a many-to-many relationship between “PerksCard” and “Ticket”.
* **includes:** This relationship associates a "Ticket" with a "Service". It suggests that a ticket may "include" certain services, such as meals, entertainment, or other amenities. A ticket can include many services, however a service can only belong to one and only one ticket.
* **buys:** This relationship connects a "User" with a "Ticket," indicating that users can "buy" tickets. A ticket can only be bought by one and only one user, however a user can buy 0 or many tickets, it’s a one-to-many relation.
* **assignedTo**: This relationship links a "Ticket" with a "Flight". It indicates that tickets are "assigned to" specific flights for travel. 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". It suggests that users can "check" or board flights. A flight can be checked by 0 or many users, and a user can check 0 to many flights.
* **flies:** This relationship connects an "Airplane" with a "Flight". It indicates that airplanes "fly" on specific flights, implying that airplanes are used for air travel. An airplane can on 0 to many flights, however a flight can only be executed by one and only one airplane.

Written Constraints:

* for a flight not to be canceled there should be 10 passengers.
* UBirthdate should be greater than 18.
* The range of the reduction price is from 0 to 100%.
* The seat number is unique.
* A passenger is considered an adult (Own an identification number)