CS 550 – Database Concepts

Project Component 2: Mapping Entity-Relationship (ER) Diagrams to Relational Database Schemas

Dr. Wassim Itani

Project Topic: Design of a database system for a frequent flyer program

Project Collaboration Model: This project component should be developed in a **team of 2 members minimum and 4 members maximum**. **You cannot work independently without a team.**

Due Date/Time: 03/10/2023 11:59:59 PM.

Deliver the .sql script file containing your CREATE TABLE SQL statements and a readme.txt file containing the names and GIDs of the group members on Blackboard by the above due date/time. Each member should submit the same copy of the files on Blackboard to secure an entry in the Grade Center.

Project Component 2 Description

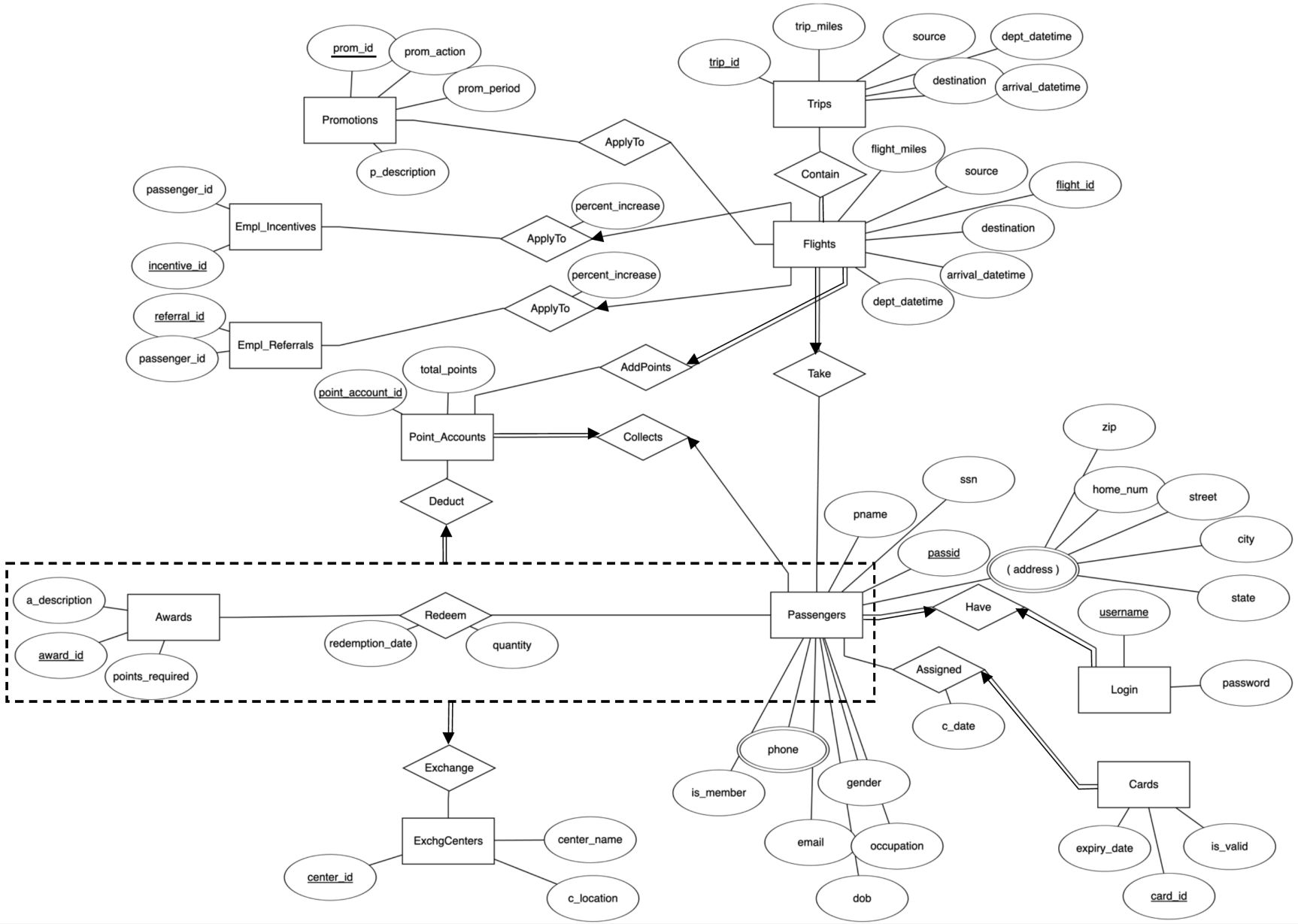
After the long discussions with the 550Airlines representatives, the group decided to use the following ER diagram for representing the frequent flyer database. Your task in this project component is to translate the ER diagram into a relational schema on the Oracle database. In other words you need to convert the ER entities and relationships into relational database tables satisfying the business rules and constraints. Apply the procedures we discussed in class to map the entities, attributes, and the Many-to-Many, 1-to-Many, and 1-to-1 relationships in the ER diagram to relational database tables. The following is the set of steps you need to apply in this project component:

1. Study and understand the structure of the ER diagram. Stand on the significance of each entity, its attributes, and relationship(s) with other entities in the database. You should end up with **16** relational tables if you did the mapping correctly. If you find anything ambiguous in the diagram including the entities, attributes, and relationships, refer back to the 550Airlines representatives (The GTAs, UTA, and the Professor).
2. Translate the entities, attributes, and relationships in the ER diagram into their respective relational tables using the **CREATE TABLE SQL** statement. Make sure that your tables represent a valid mapping of the **Many-to-Many**, **1-to-Many**, and **1-to-1** relationships in the ER diagram and, accordingly, they contain the correct attributes, primary key, and foreign key constraints.

3. Store your CREATE TABLE SQL statements in a single .sql script using Oracle SQL Developer. Your .sql file should be named as follows: P2_[Your Last Name]_[Your GMUID].sql. For instance, if John Smith with GMUID: G12345678 were to submit this file, John would name it: P2_Smith_G12345678.sql
4. Execute your .sql file on the GMU Oracle server and make sure that all the tables are created successfully.
5. The rubric for grading this component is very simple. For each correct CREATE TABLE SQL statement you will receive 5 pts (totalling to 16x5 = 80 pts). 20 points will be awarded for the successful execution of the .sql database creation script on the Oracle server.

Hint and Naming Convention:

1. Use the same entity and attribute names as specified in the ER diagram in your relational table specifications.
2. As you already know, Many-to-Many relationships between two entities in the ER diagram result in creating a third table to represent this relationship. To make it clearer with an example, the Many-to-Many relationship between the Flights and Promotions entities in the ER diagram is realized using 3 relational tables: Promotions, Flights, and a third table linking the Promotions to Flights. Name this third table after the two entities participating in the Many-to-Many relationship. In our example, let it be named Promotions_Flights. Apply this naming convention when mapping the Many-to-Many relationships in the ER diagram to the relational tables on Oracle.


prom_id
prom_action
prom_period
Promotions
p_description
ApplyTo
trip_miles
trip_id
source
dept_datetime
destination
arrival_datetime
Trips
Contain
flight_miles
source
flight_id
destination
arrival_datetime
dept_datetime
Flights
passenger_id
Empl_Incentives
incentive_id
percent_increase
ApplyTo
percent_increase
ApplyTo
referral_id
passenger_id
Empl_Referrals
AddPoints
Take
total_points
point_account_id
Point_Accounts
Collects
Deduct
zip
ssn
home_num
street
pname
city
passid
(address)
state
username
Have
Passengers
a_description
Awards
award_id
points_required
Redeem
redemption_date
quantity
Assigned
c_date
Login
password
phone
is_member
gender
email
occupation
dob
Cards
expiry_date
is_valid
card_id
Exchange
ExchgCenters
center_name
center_id
c_location