COMP3278B Introduction to Database Management Systems

Assignment1 Part1:**ER-Modeling**

Due Date: 2025 Mar 16 (Sunday) 17:30 pm

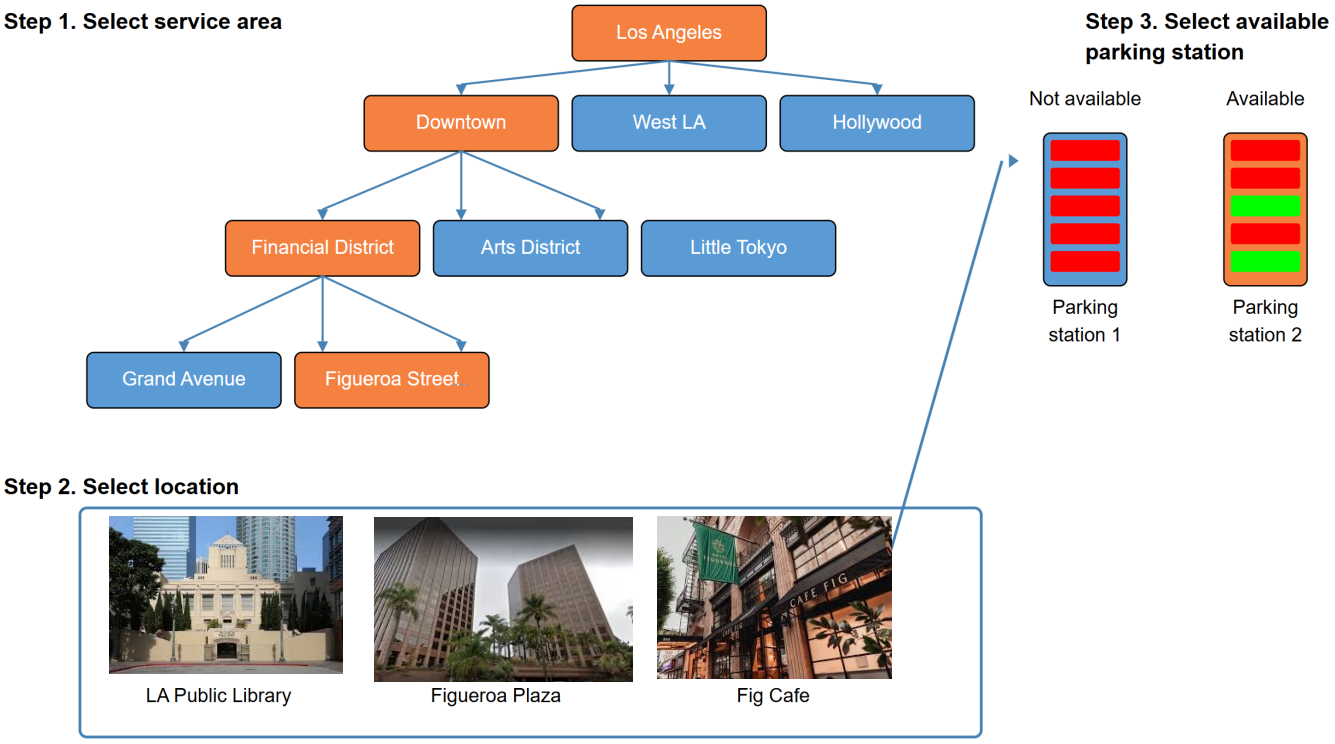
The EcoScoot company provides rental service of electric scooters to its registered members in Los Angeles. You are a database designer of the EcoScoot company, and you are designing the database to support a system with the following functions:

1. **Membership System**
    - Each member is required to provide their name, email, and contact number in the registration form. The system will automatically generate a unique member ID upon registration.
2. **Scooter Management System**
    - There are scooter parking stations, each equipped with a unique station ID and contains a certain number of parking slots.
    - Each parking slot is assigned a unique slot ID, exclusive to that particular parking station.
    - The company possesses numerous electric scooters, each distinguished by a unique scooterID.
    - Any scooter can be parked in any available parking slot within a parking station.
    - Each scooter has a battery level recorded as a percentage of full charge.
3. **Scooter Rental System**
    - A member can initiate multiple rental transactions, each involving the rental of one scooter.
    - Each rental transaction is assigned a unique transaction ID, capturing information such as which member is renting which scooter.
    - The transaction records which parking slot the user retrieved the scooter from and the retrieval datetime, as well as which parking slot the user returned the scooter to, and the return datetime.
    - Additionally, the transaction includes details of the payment amount and the distance traveled during the rental period.

4. **Coupon System**
    - EcoScoot Company issues coupons to its members, each with a unique coupon ID and an expiration date. There are two types of coupons: Free Ride Coupons and Discount Coupons.
    - Free Ride Coupons: Each coupon can be used to redeem one free scooter rental transaction.
    - Merchants Discounts:
        i. These coupons are not tied to the rental of scooters but offer discounts accepted by one or more partner merchants.

ii. EcoScoot Company collaborates with various partner merchants, each having a unique merchant ID. Some of these merchants also maintain scooter parking stations.

5. **Reservation System**
   - Members can reserve a scooter at any available parking station with a reservation interface that operates as follows:
   - Members can search for a service area in Los Angeles using a hierarchical structure (e.g., Downtown, West LA, Hollywood), eventually selecting a location - this is the lowest-level service area without any sub-service area (e.g., Venice Beach, Santa Monica Pier).
   - Each location may host zero to many scooter parking stations.
   - Members choose a parking station with an available scooter and proceed to make a reservation.
   - Each reservation is assigned a unique reservation ID and records the datetime of the reservation .



Assignment tasks

[50%] Task 1. Please draw an E-R diagram to capture all the requirements above.

- If there is any information about the data model that is not listed in the specification, please make a reasonable assumption and list your assumption in your design.
- Marks will be deducted if unnecessary components are added to the tables. Please follow the problem specification when you decide on the name of the components.
- You are encouraged to draw the E-R diagram using any kind of editor, this can help us to read and understand your data model. If you choose to draw the E-R diagram by pen/pencil, please scan your work and submit a PDF file. We may ask you to re-submit a clearer version in case we cannot read the handwriting.

[50%] Task 2. Please translate your E-R diagram into relational table schemas.

- For each relation, underline the primary key and specify all the foreign keys if any.
- You only need to give the table schema in text form. You do not need to draw the schema and do not need to provide the data type/SQL to create the tables.
- Enjoy this assignment as a practice related to Chapter 2 😊

Submission

- Please submit one PDF file to Moodle on or before the deadline of this assignment.
- Should you have any enquiries, please feel free to post on Moodle. Thank you! 😊

Please feel free to post your questions on Moodle forum or contact us (TA Leo u3010267@connect.hku.hk) if you encounter any difficulty with this assignment. We are very happy to help.

We wish you enjoy learning database technologies in this course!