Assignment 1

Aim

The objectives of this assignment include:

- Interpretation, Analysis and Creation of Conceptual Schema
- Translation of Conceptual Schema into Relational Schemas

Task 1 (5 Marks)

Background

As a development team leader, you have been asked to design the database for a local company with the requirements given as follows.

Business Requirements

Well Management Private Limited needs a database to help with the maintenance of a private residential estate. There are various types of apartments in the estate, and the monthly maintenance fee is based on the apartment type (single-room, double-room, three-room, 4-room and Penthouse). Each apartment has a block number, unit number, owner's name, and phone number. The block number combined with the unit number is unique for each apartment. Each apartment receives a monthly bill at the end of the month. The monthly bill records the year and month of the bill, the amount due, date due and date paid.

There are facilities in the residential estate. Each facility is identified by the facility type and a number. For instance: swimming pool 1, swimming pool 2, playground 1, playground 2, Reading room 1, Reading room 2, etc. The condition and service remarks of each facility must also be recorded. Some facilities require booking and payment for each use. For instance: tennis court, function room, meeting room, squash court, etc. For the paid facility, the hourly fee and restriction (example: max two hours per booking for tennis court) must be recorded. The booking record includes a reference number (unique), date of booking, start time of booking, end time of booking and fee due. Each booking can only reserve one facility.

Task 1 Requirements

A) Based on the business requirements stated in the above scenario, use UMLet tool to create a drawing of a conceptual schema in a notation of UML simplified class diagrams. No other notation will be accepted. Hand-drawn diagram will NOT be accepted.

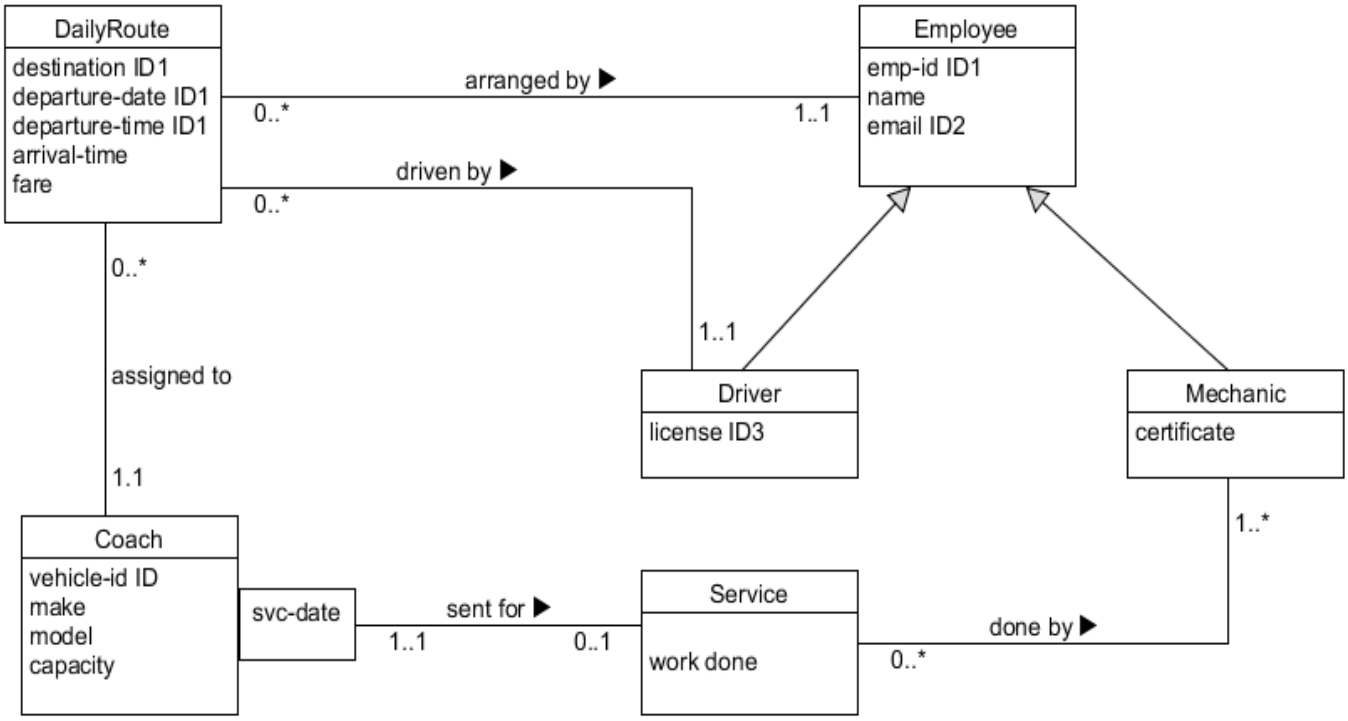
B) You are not allowed to add attributes (as identifier) or change the attributes stated in the scenario.

C) *If necessary*, you may include assumptions to justify your design decision if you think the requirements do not provide a clear decision. For instance, you may state the assumptions which lead you to decide that the association is one-to-one, one-to-many or many-to-many. If you include assumptions in your design, the assumptions must not re-state or contradict the requirements stated in the scenario.

Task 2 (5 Marks)

Background

You have been tasked by your manager to assist with the analysis, design and implementation of a database system for a local coach service company. You are to transform the following conceptual schema into a set of relational schemas.



Task 2 Requirements

A) Transform the above conceptual schema to a set of relational schemas. You are not allowed to add or modify attributes in the conceptual schema. Use the ***Association method*** to transform generalisation/specialisation.

B) The relational schemas must be presented in the format described on page 44 of the lecture file: Logical Design.pdf. (Refer to the screenshot below.)

```
CUSTOMER(name, phone, address)
PRIMARY KEY = (phone)

FREQUENT-CUSTOMER(phone, points)
PRIMARY KEY = (phone)
FOREIGN KEY = (phone) REFERENCES CUSTOMER(phone)

ORDERS(order#, odate, phone)
PRIMARY KEY = (order#)
FOREIGN KEY = (phone) REFERENCES CUSTOMER(phone)
```

Submission

A) Please submit a single PDF file.

B) Please name your file as: <Your group>_<UOW ID>_<full name>.pdf. For instance, T1_1234567_TanHongEng.pdf

C) Submission must be uploaded to Moodle before the due date (set on Moodle). NO email submission is allowed.

D) The late submission penalty (25% per day) will be applied regardless of the reasons: network delay, disconnection, etc. Therefore, you are advised to avoid peak submission period near the submission deadline.

E) Re-submission (because of incorrect file included in the original submission) will be treated as late submission if it is submitted after the deadline.