

Assignment 2

Aim

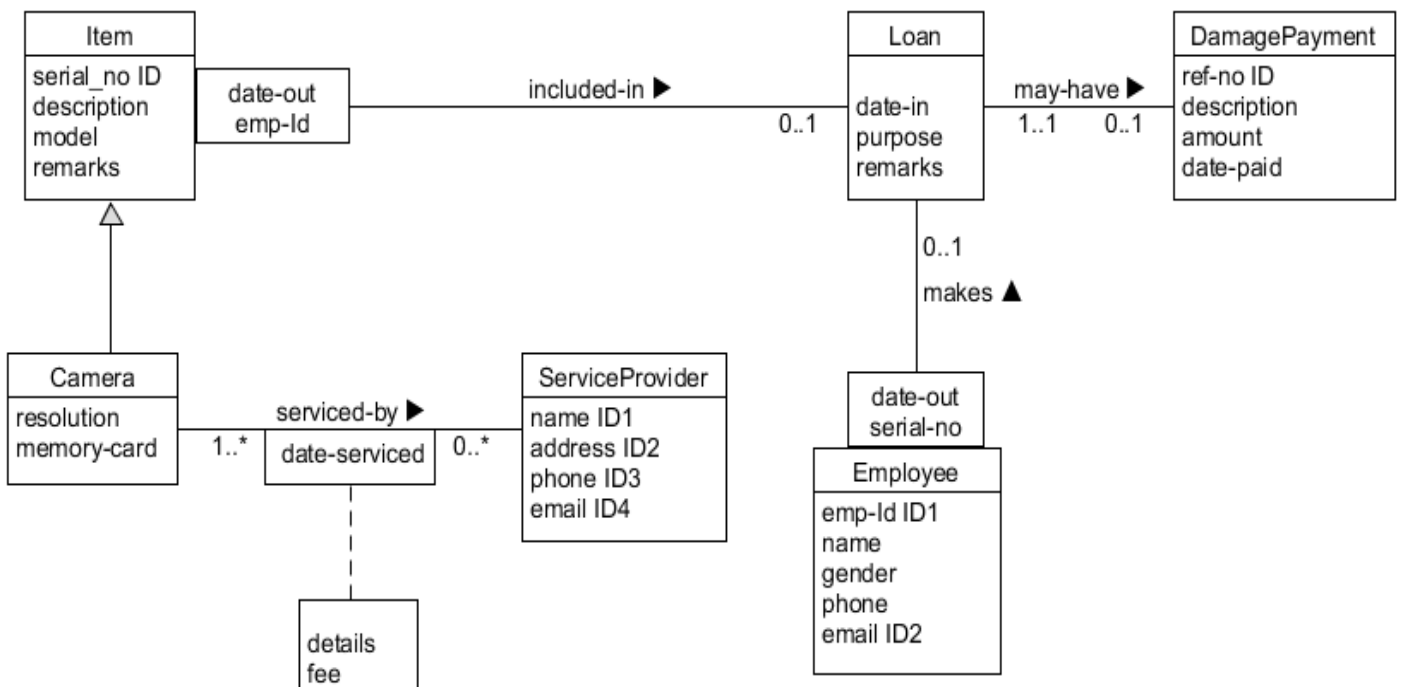
The objectives of this assignment include:

- Interpretation, analysis of conceptual schema to implement/modify structures in a relational database.
- Design and implementation of queries and data manipulations in SQL.

Task 1 (5 Marks)

Background

A company has a collection of electronic appliances (laptop, scanner, camera, tablet, etc.) that employees can loan for official or personal use. The company needs a database to manage the records of electronic appliances, loans, etc.



Requirements

- Transform the conceptual model to a set of relational schemas. Assume, that association method must be used to transform generalization/specialisation. You must not add attribute(s) that are not included in the conceptual model as primary key in a relational schema. You must not modify attribute(s) in the conceptual model.
- Based on the relational schemas, provide SQL statements to create the tables. You must choose an appropriate date type and length for each column. You must also include appropriate check constraints and foreign key constraints to ensure data integrity.

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- C) To prepare for possible changes in the near future, the company requests a set of ALTER Table statements to alter the table structure **without** dropping and re-creating the tables.

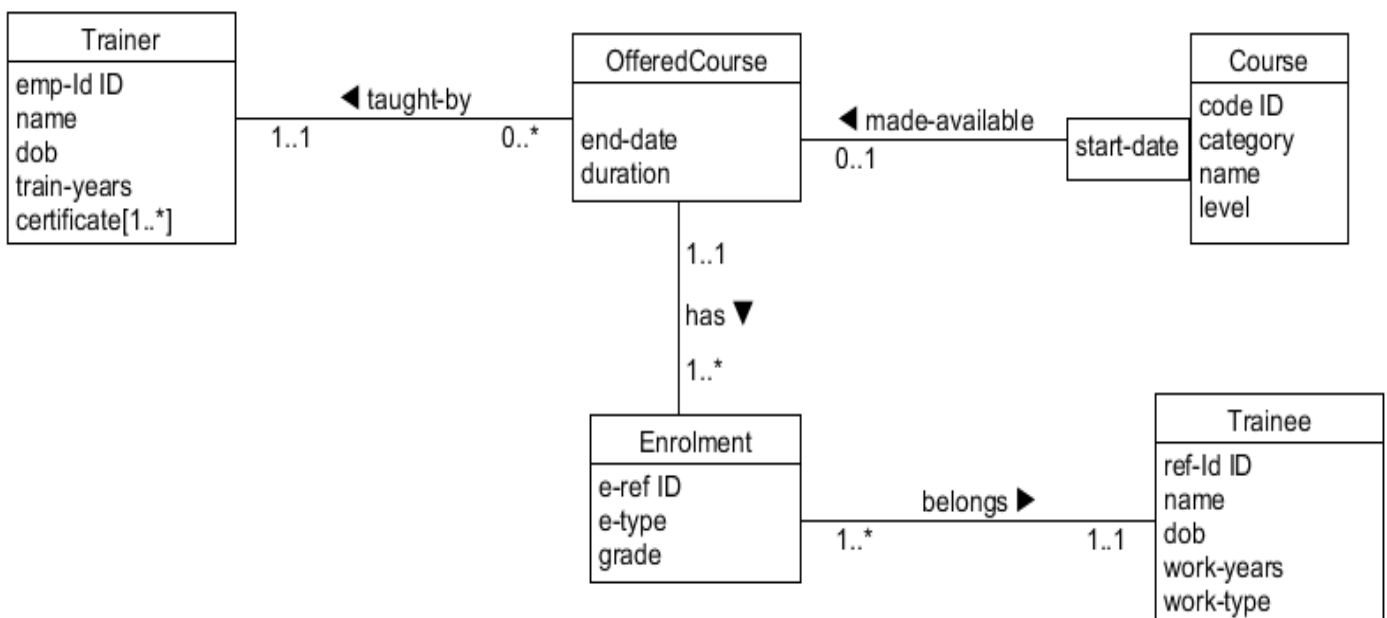
The changes are stated below.

- Add a column called **status** to the **Item** table. The possible values are: 'Available', 'On loan' and 'Under service'. The default value is 'Available'.
- Add a constraint to ensure that the values in **amount** (of **DamagePayment**) are greater than 0.

Task 2 (5 Marks)

Background

A private training institute has employed you to research and implement SQL statements to support their data management operations. The institute offers a variety of short courses for the general public. The company's database also contains information about the trainers, trainees and the enrolment of the offered courses. A conceptual schema of the database is given below.



Please use the files: `A2dbcreate.sql` and `A2dbload.sql` to create the tables and load the records. You should study the statements in the script files as they hold important clues to guide you in your subsequent implementations of SQL statements.

Requirement

For each of the queries (A, B, C) below, use a *single* SELECT statement (join, subquery, derived column, etc.) to retrieve the records. You must not create temporary tables or views.

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- A) Retrieve trainers who have more than one certificate. For each record, display the following columns:
- empld
 - name
 - dob
 - trainYears
- B) Retrieve courses that have been offered more than two times. For each record, display the following columns in ascending order of course code.
- course code
 - course name
 - offered course start date
 - offered course end date
 - offered course trainer's name
- C) Retrieve trainees who work more than 15 years, and the courses they attended. For each record, display the following columns in ascending order of trainee's refId:
- trainee refId
 - trainee name
 - trainee workYears
 - trainee workType
 - course code
 - course name
 - offered course start date

For each of the scenarios (D, E) below, provide a sequence of `INSERT`, `UPDATE`, `DELETE` statements to make the changes. You are not allowed to drop, re-create or alter (disable/enable) consistency constraints during the modifications.

- D) Trainer Heng Hoon (T03) has resigned from the institute, and today is his last day of work. Provide the SQL statements in the correct sequence to remove his records from the database.
- E) A new course is to be added to the database and made available to the general public for enrolment. Below are the detailed records. Provide the SQL statements (in the correct sequence) to add the new records.

code	C501
category	Language
Name	Mandarin
Level	1

start-date	2024-02-18
end-date	2024-02-18
duration	1
taught-by	T021

Submission

- A) Please submit a single text file which contains the following:
- Relational schemas for task 1
 - SQL statements to create the tables for task 1
 - SQL statements to alter the tables for task 1
 - SQL statements to retrieve the records for task 2 together with the query results
 - SQL statements to modify the records for task 2
 - Execution result of the statements.
- B) The SQL statements must be arranged in the correct sequence of execution so that the marker can execute them to create, alter the tables and modify the records.
- C) Please name your file as: <Your group>_<UOW ID>_<full name>.txt. For instance, T1_1234567_LeeBai.txt.
- D) 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.