



DB Project Assignment Part 2: Database Schema Design

Group Assignment (5%)
(INFO2120)

11.04.2014

Introduction and Objectives

This assignment is about the logical database design for our car sharing scenario. The objectives are to gain practical experience in relational schema creation including specifying integrity constraints based on a given entity-relationship diagram.

This is a group assignment for **teams of up-to 3 members** that is **due at 4pm on Tuesday in week 8** (April 29th). Your solution will be marked for correctness and completeness of the database schema with regard to the grading scheme as described on the last page.

Please note: The individual mark awarded for each assignment is conditional on *each as individual team member* being able to explain details of your schema to your tutor or the subject coordinator if asked. Late submissions will attract a 20% penalty per day late.

Please also keep an eye on *the discussion forum and announcements* in Piazza. You will find there also links to on-line documentation and hints on tools and languages needed for this assignment.

Relational Database Schema for the Car Sharing Database

Your task is to create a relational database schema for the following entity-relationship design that is shown on the following page. In particular, your solution should include

- all tables and attributes with suitable data types to represent the complete model
- correct primary keys for all tables
- correct foreign key specification including ON DELETE and ON UPDATE clauses if suitable (e.g. for weak entity types)
- any required additional integrity constraints from the E-R model that you can express by means of NOT NULL, DEFAULT, UNIQUE or CHECK constraints.
- For achieving Distinction+ level, you also need to solve the extensions described on page 3.

Tips: Please try to keep the number of integrity constraints minimal, in particular do not overdue the use of NOT NULL constraints. It is Ok if you introduce some surrogate keys in case of complex primary keys which have repeated use – but make sure that the 'natural' identifying attributes are still candidate keys.

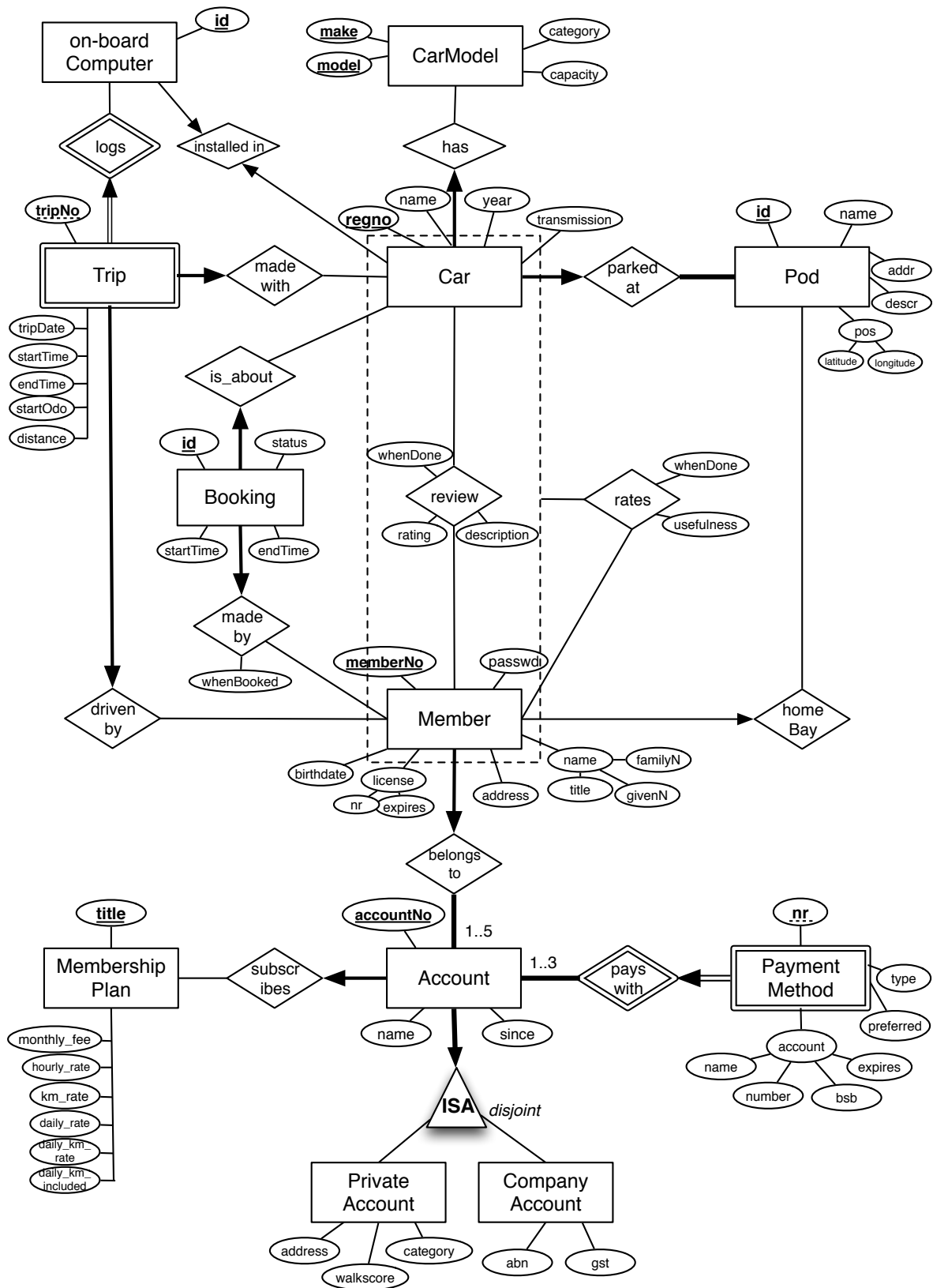


Figure 1: E-R diagram of a car sharing database.

Extensions. Teams who strive for Distinction or High Distinction grades should also map any of their modelling extension that they did for Assignment 1. You should describe any such extensions in an additional brief (*Discussion.txt*) as part of your assignment, and also include the proper integrity constraints for your extension.

In order to achieve a Distinction or High Distinction grade, you should

1. create your tables as part of a **dedicated SQL schema** 'CarSharing',
2. create a relational schema with **at least one own extension** for the given E-R model, that makes sense for a car sharing organisation. Which extension is up-to you (ideally the same that you included in Assignment 1). Explain it briefly in the *Discussion.txt* file.
3. include at least **one meaningful assertion** as integrity constraint (as a comment in your SQL script as this will not execute on neither PostgreSQL nor Oracle directly) and define and use **one meaningful user-defined domain type**.

Submission Details

Please submit your solution in the '**Assignment**' section of **USyd eLearning** by the deadline in week 8:

- a **SQL script** with corresponding CREATE TABLE statements for your database design, including any integrity constraints or user-defined domain specifications, that can be readily executed on PostgreSQL; if you need to capture some non-supported integrity constraint as an SQL assertion, include this as a comment in your script.
- a **Discussion.txt** file containing a (brief) discussion of any mapping problems and how your team resolved them, as well as any further comments on your solution. Clearly indicate when you added ideas and extensions beyond the scenario description, and how you modelled those.
- a filled-in **assignment cover sheet** that the work is original and not plagiarised from others.

Assessment Criteria

Your team's final grade will depend on how sophisticated and correct your solution is. You can find the detailed [marking rubric](#) by clicking on the corresponding link of the assignment submission page in eLearning.

Grade Descriptors

High Distinction 85 – 100%	The solution demonstrates an outstanding understanding of relational database design, including some original ideas ('extension'), an assertion, and some discussion of mapping or constraining problems; the submission is a complete solution of the whole scenario including integrity constraints, and any additional modelling task with excellent quality of all deliverables ; evidence of some further research into the topic
Distinction 75 – 84%	Thorough understanding of relational database design; medium level of original thinking and critical discussion of at least one mapping or constraining problem; the submission is a complete solution of the all model parts including all integrity constraints and an approach to at least one extension to the described task and one assertion with accomplished quality of the deliverables
Credit 65 – 74%	Good understanding of relational schema design; adequate level of original thinking; complete solution of the mapping of all the given E-R diagram including the capture of any parts classified as 'Credit-level' and including most integrity constraints; average quality of deliverables.
Pass 50 – 64%	The submitted relational database schema that demonstrates competence in SQL and relational schema mapping including suitable choices for foreign and primary keys, domain types and NOT NULL constraints. At least the fundamental entity and relationship types are mapped , namely the <i>cars</i> , <i>Pods</i> , <i>members</i> and <i>accounts</i> , <i>plans</i> , and the <i>bookings</i> and their direct relationships.
Fail below 50%	Falls short of the basic requirements for a Pass.

Academic Honesty

IMPORTANT: Policy relating to Academic Dishonesty and Plagiarism.

All teams must declare that the work is original and not plagiarised from the work of others. In assessing a piece of submitted work, the School of IT may reproduce it entirely, may provide a copy to another member of faculty, and/or communicate a copy of this assignment to a plagiarism checking service or in-house computer program. A copy of the assignment may be maintained by the service or the School of IT for the purpose of future plagiarism checking.