

Database App. and Design (SOC-3060), Spring 2022

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Homework 3

Issued Wednesday 6 April 2022. Due as **electronic copy uploaded into eClass System by Wednesday 13 April at noon (12:00, strict deadline)**. Hardcopy deadline: none. Only team-leaders submit.

FILES TO DELIVER (ELECTRONIC SUBMISSION): A single zipped archive (.zip) named "00X-ID" (example: 001-U2011123), where 00X and ID refer, respectively, to the section (X variable on range 1..4) and the ID number of the student who submits the homework into eClass. In doubt, ask. The archive shall contain the following files:

- | | |
|---|-------------------------------------|
| - file [0] (cover) | Name & Format: cover.pdf |
| - file [1] (ERWin) (source file) | Name & Format: HW3main.erwin |
| - file [2] (Screenshot of Logical Level of [1]) | Name & Format: LogicalSchema.jpg |
| - file [3] (Screenshot of Physical Level of [1]) | Name & Format: PhysicalSchema.jpg |
| - file [4] (DDL-SQL code from ERWin) | Name & Format: DDL.sql ^a |
| - file [5] (LaTeX of file [4] imported to MySQL) | Name & Format: DDL-MySQL.tex |

Requirement 1: The **name** and **format** of each file above is mandatory (optional *image* format for [1] and [2] allowed). In particular, do NOT send a MS Word document (.doc/.docx) for the cover! Send the PDF for it. In doubt, ask. *Penalization applies for violation of this requirement.*

FILES TO DELIVER (HARD-COPY): none.

^aAlternatively, use can use .ddl, that is, the standard format exported by ERWin's function of "Forward Engineer".

Please note:

0. Deadline is **strict**. Electronic deadline passed without submission implies score zero (0/100).

1. The suggested number of students is 1 to 3 from the same section. We allow teams formed by 4 or 5 members from max two sections. We grade teams of **5 members by reducing the score by factor 3/5**.

1.1 Teams of **more than 5 members are not permitted**.

2. Provide a cover [mandatory, file [0] in list above] for your homework.

Note: You are pretty free to decide the cover template, provided that you indicate the following data:

- (a) course name, code, and semester, namely: Database App. and Design (SOC-3060), Spring 2022
- (b) homework number, namely: Homework 3
- (c) **ID number, full name and section number of each team member**
- (d) date of document.

IMPORTANT: Submissions without cover are rejected without review. Students whose ID, full name and section number do not appear on the cover are assigned score zero (0/100).

3. Only the team-leader shall submit the document. Please do not submit multiple copies.

4. Homework that contains some evident elements of **plagiarism or cheating**, either among teams or from existing material (e.g., from the Internet, textbook's Instructor Manual if available online, etc.) implies score zero (0/100). Serious offence to Academic Integrity will be advised to Academic Affairs.

NB: *Sharing of homework's files among teams is never permitted at whatever stage of work in progress and, statistically, it is the main source of cheating issues and zeros. You can share ideas, not files!*

PARTICULAR SETTING:

To proceed, you need ERWin, MySQL and the GUI *phpMyAdmin* (provided within MySQL).

PROBLEMS AND EXERCISES:

Exercise 1 – AN AIRLINE DATABASE. Consider the Logical Schema in Figure 1¹ (page 3) produced by optimized data model mapping of the Conceptual Diagram (ERR-diagram) in Figure 3 (page 5) extended with subclasses “Civil_Airplane” and “Tourism_Airplane”. Do the following:

1. By using ERWin, create a new file and, within it, a new “model” with name HW3-ID², where ID is the ID number of the student who submits the file (team leader).

NOTE: this file is [1] in list above. (So, name and format of file shall be: HW3main.erwin.)

In particular, do:

- select “Logical/Physical” models;
- select MySQL among the database systems in the list showed at file opening;
- select the notation (“crow’s foot” notation, called Information Engineering) for both Logical and Physical levels;

2. Rewrite in ERWin’s **Logical Level** the logical schema provided in Figure 1.

NOTE: when you finished it, you will take a screenshot of the logical schema you produced, and create file [2] as per the list of files to submit.

3. “Switch” your ERWin’s project (referred to as “model” in ERWin’s terminology) into **Physical Level**. Then complete the schema you created in the previous step by adding datatypes and domains. NB: You can decide any suitable datatype and domain for each attribute, *provided that you decide it for each attribute*. In other words, **use of default values will be penalized**.

NOTE: Display the tables in grid format and be sure that datatypes are displayed and tables don’t overlap each other and well organized into the drawing space.

NOTE: When you finished it, you will take a screenshot of the logical schema plus datatypes and domains you produced, and created file [3] as per the list of files to submit.

4. From the **Physical Level**, go to “Actions” and select “Forward Engineer -> Schema -> Preview”. (Variants are possible here as it depends on what version of ERWin you use.) Save the SQL code generated by ERWin into a file with extension (or format) .sql or .ddl.³

NOTE: this file is file [4] in list of files to submit.

5. By using *phpMyAdmin* in MySQL, create a new database with name HW3-ID (ID is the ID number of team-leader of the team who works on the homework). Then:

- **Import** the .sql (or .ddl) file you created (step 4, file [4]) into the database you created now.
- **Export** the database schema you imported by using ‘LaTex’ as exporting format. You can do it by using the “Export” button in *phpMyAdmin* together with setting parameter “LaTex” and clicking “Go” (see Figure 2 for reference).

NOTE: the LaTex file you export is file [5] in list of files to submit.

¹Red arrows and attributes represent *optimized relationship sets*; blue arrows represent *identifying relationship sets*.

²Default name by ERWin is “Model_1”.

³Forward engineering by ERWin is discussed in Week 11 (current week), Lecture 1; slides will be available in eClass.

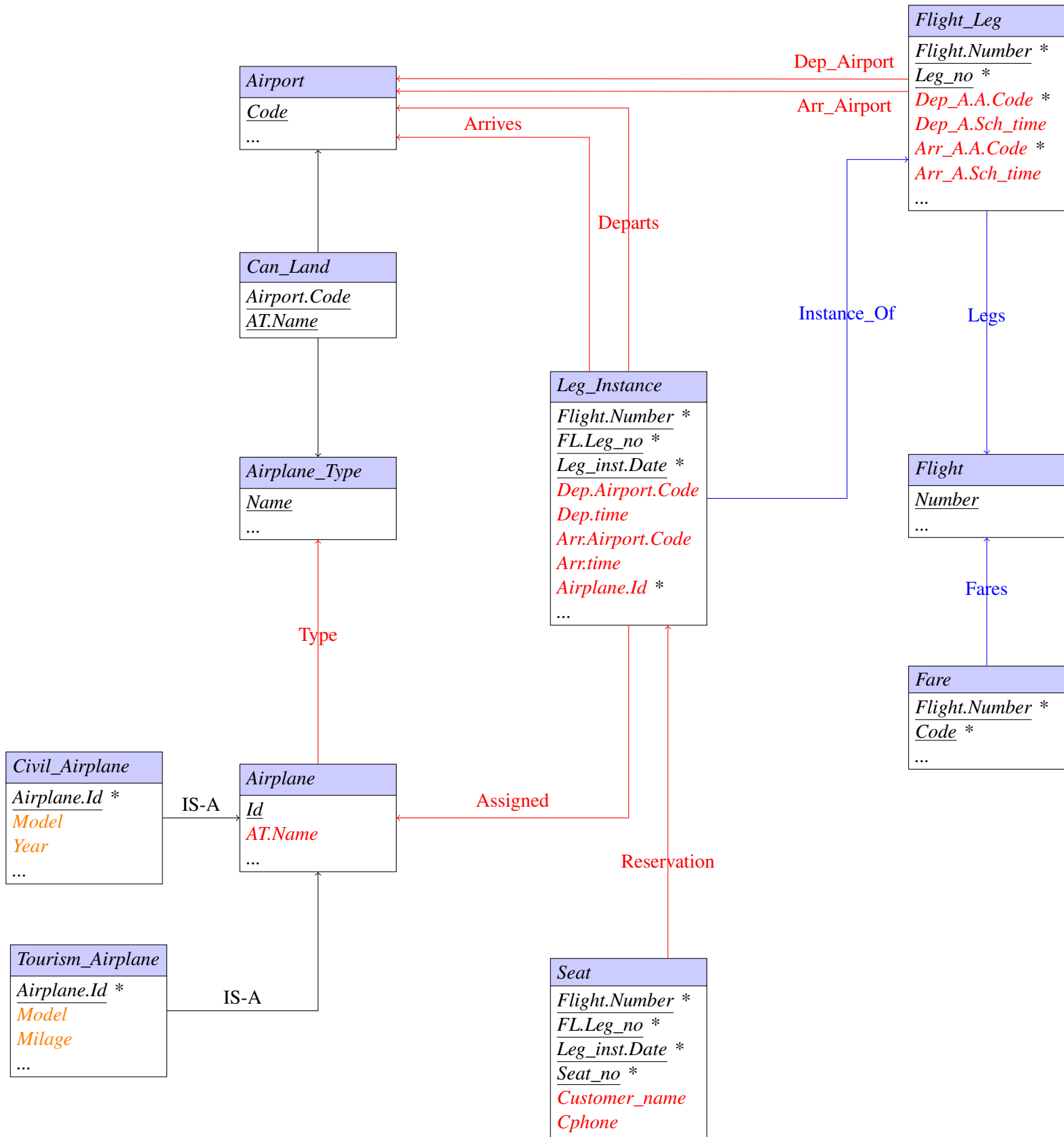


Figure 1: Logical optimized schema for the AIRLINE database.
* means NOT NULL and models total participation.

Server: localhost:8889 » Database: DBMclass

Structure

SQL

Search

Query

Export

Import

Exporting tables from "DBMclass" database

Export method:

☒ Quick - display only the minimal options

☐ Custom - display all possible options

Format:

LaTeX

Go

Figure 2: Sample of how to “Export” your database into LaTeX format.

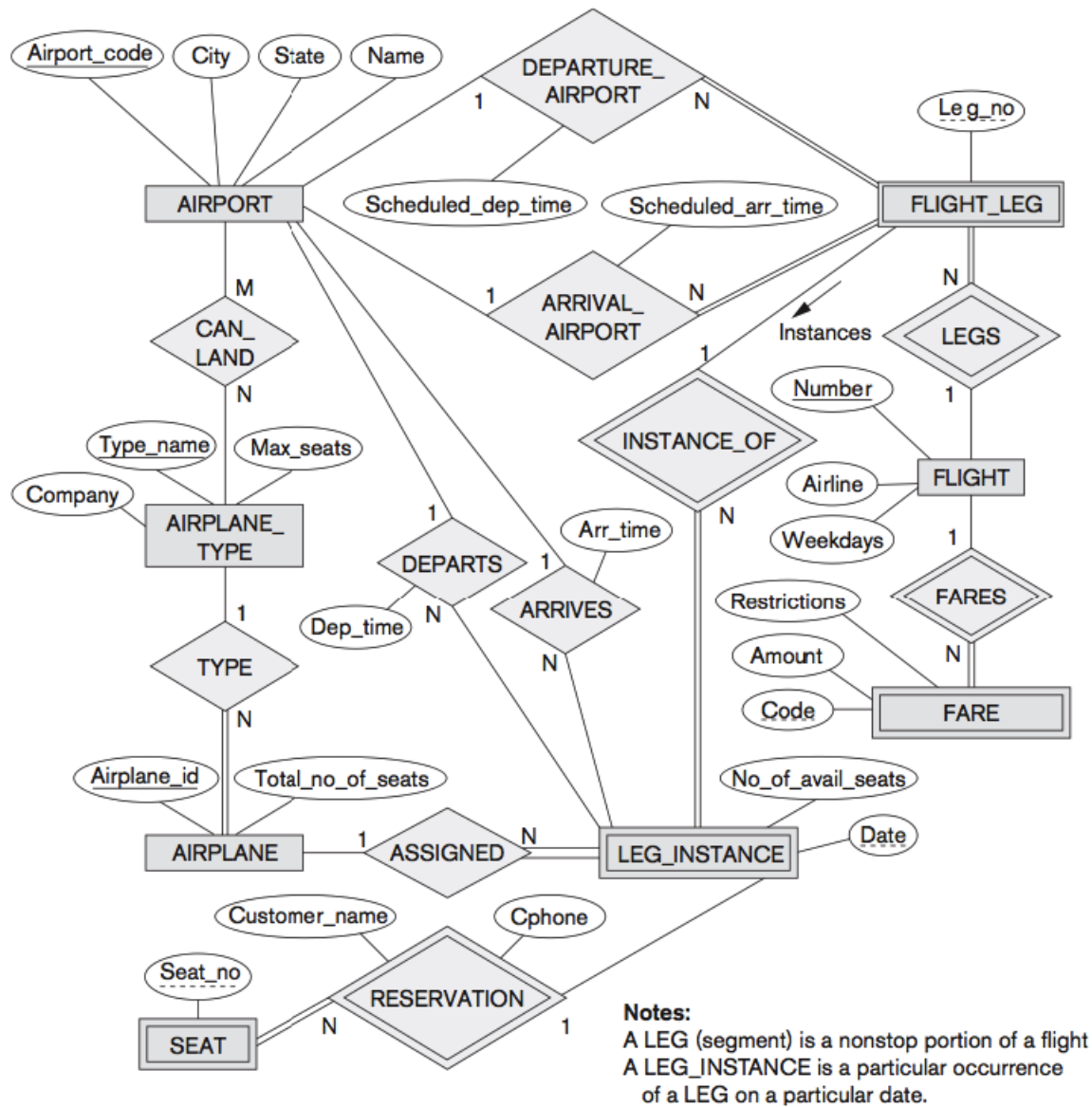


Figure 3: An AIRLINE database.