

Προηγμένες Βάσεις Δεδομένων  
Project, Part 1  
Proposal & Design  
Data Modeling and Database Design

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DEADLINE: January 13, 2023 at 11:59pm

Groups of 2 students

## 1 Introduction

The goals of the first part of your course project are to:

1. identify a collection of sample queries;
2. formulate data requirements for your application;
3. draw an ER-diagram that captures your requirements;
4. translate your ER diagram into the Relational Model;

### 1.1 Sample Queries

Specify ten example queries that you think are of interest in the domain of your application. You need criteria to decide what to include into the data requirements and what not to include. A good starting point for developing a database is to identify typical queries that users will pose, either directly or via applications. These queries will be used to direct the formulation of data requirements and to check them for completeness. Write up the queries in plain English/Greek. Do not be concerned whether they can actually be expressed in a query language (SQL) for this assignment.

### 1.2 Data Requirements and ER-diagram

In reality, the formulation of requirements and the design of the diagram go hand-in-hand. Your application should have a size that makes it non-trivial. As a guideline, aim at a diagram of minimum 10 entities and relationships in total<sup>1</sup>. Before drawing the diagram, you are asked to write up a text with data requirements.

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<sup>1</sup>I am not asking for 10 entities and 10 relationship but the sum of entities and relationships to be at least 10.

The ER-diagram should follow the Data Requirements and it should NOT BE hand-drawn. Tools you can use are: MySQL Workbench, DIA, OmniGraffle (Mac) or MSVisio.

VERY IMPORTANT: You should specify, after you draw the ER-diagram, which of your requirements cannot be modelled by it.

### 1.3 ER-to-Relational

Given the ER-diagram that you designed, convert it into a relational database. You should include:

- The set of relations;
- Key and referential integrity constraints, (you can use the notation we used in class and the examples);
- The constraints that cannot be captured by your relational model;

### 1.4 Deliverables, write-up sections

The deliverable will be a PDF document consisting of the following parts/sections (use 11pt fonts):

1. the title of the project;
2. a short executive summary (max. half a page);
3. a collection of 10 sample queries;
4. a text with data requirements (max. 1 page);
5. The ER-diagram (min of 10 entities & relationships altogether);
  - make sure you identify the requirements that could not be captured by the diagram. Include them in a subsection of max. 1 page.
6. The set of relations with all their constraints;

### 1.5 Deadline and Submission

Each group or **2 students** will submit their work on the eClass by

January 13, 2023, 11:59pm

PLEASE MAKE SURE THE NAMES OF THE GROUP MEMBERS ARE ON THE WRITE-UP OF YOUR SUBMISSION.