Exercise 01: Introduction

Task 1: Problems with data redundancy

You live in a shared apartment with two other students, Julia and Christian. Each person has their own room, and in addition you have a shared living room and kitchen. Because you get on well with each other, you do a lot of things together, cook together, celebrate together and also cook for each other. So there's a lot going on in your shared apartment!

a. List three very specific problems that this scheduling process can cause for the three of you.
b. Which solution would you suggest?

Task 2: Term definitions DB, DBS, DBMS

Define each of the following terms in your own words. Try not to read the script beforehand. One sentence per term is enough.

a) Database Management System (DBMS)
b) Database (DB)
c) Database System (DBS)
d) External schema
e) Conceptual schema
f) Internal schema

Task 3: Schema architecture

You are tasked with developing a management system for the examination grades at the TH Rosenheim. There are only two types of users of this system: students, who are of course only allowed to see their own grades, and professors, who enter the grades for the lectures they give.

a) What could the two external schemas look like for these two user groups? Draw possible tables as a solution.
b) What could a conceptual schema look like? Draw possible tables as a solution.
c) What could an internal schema look like? Answer the question in one sentence.

Task 4: Data independence

Your management system from Task 3 is very successful, so the Examinations Office contacts you and would also like to be able to access your database as a third user group. The Examinations Office needs access to all data, so you create a third suitable external schema for this purpose.

a) Explain what *logical data independence* means here.
b) Due to the numerous large accesses by the Examinations Office, your database becomes very slow. So you decide to optimise the internal representation. Explain what *physical data independence* means here. What significant advantage does this have?

Task 5: Application architectures

What might a 3-tier architecture look like for your university management system from Task 3?