

CEGEP VANIER COLLEGE
Department of Computer Science
420-231-VA Database

Team Project

Title: Dental Clinic Database System

Project Due: February 23, 2026

Teacher: Nagat Drawel

Instructions

1. The team project's purpose is to practice designing databases through group discussion and help you develop teamwork skills.
2. In this project:
 - a. It is required that you and your group design a miniature database system, as described below, and proceed to evaluate several queries and transactions against the database.
 - b. The team leader should be designated for each team to coordinate group meetings, allocate tasks, and submit project deliverables. However, team leaders have not yet been appointed, so please choose a leader amongst yourselves.
 - c. The tasks for each deliverable will be fairly allocated to each team member. Prior to attending group meetings, each member is expected to work independently on their allocated tasks.
 - d. Members in the same team may receive different grades based on their contribution to the project and on the overall quality of the project. For example, a member may receive less marks if they fail to meet deadlines, skip group meetings, make inadequate contributions, and so on. However, if a member fails to complete their assigned tasks, it will not impact the grades of other members.

Project Description

A dental clinic requires a database system to manage patients, appointments, treatments, and billing. The system must support day-to-day clinical and administrative operations. The following outlines the key data requirements and business operations:

- a. Patients can make many appointments with one or more dentists in the clinic, and a dentist can accept appointments with many patients. Emergency cases do not require an appointment. However, for appointment management purposes, an emergency is entered in the appointment book as “unscheduled.” (i.e., It still needs an appointment record)
- b. Each appointment is made with only one doctor and one patient.

- c. An appointment yields a visit with the dentist specified in the appointment. The visit yields a diagnosis and, when appropriate, treatment. With each visit, the patient's records are updated to provide a medical history.
- d. Each patient visit creates a bill. Each patient visit is billed by one dentist, and each dentist can bill many patients.
- e. Bills are produced to record how much the patients need to pay for the treatments. One bill can contain the cost of many treatments done in one visit at a clinic
- f. Each bill must be paid. However, a bill may be paid in many installments, and a payment may cover more than one bill.
- g. If the bill is paid by an insurance company, the deductible is submitted to the patient for payment.
- h. A patient may pay the bill directly, or the bill may be the basis for a claim submitted to an insurance company.

The description is not very specific; it only gives a general idea of what is required. There is no attribute(s) in the given schema which is necessary to express the queries and/or transactions; you need to add it to the schema and use it in your implementation. However, you are free to make any reasonable assumptions that will help you develop your ERD diagram.

Deliverable 1 Requirements:

Starting from this general description, do the following initial steps in your database design process:

1. Create an ER diagram to represent the conceptual database schema for the above scenario. Show entity types, relationship types, cardinalities of the relationships, participation constraints, attributes, and key attributes.
2. Translate your ER diagram into a relational schema using the algorithm steps introduced in Lecture 4.

What you should submit

You should submit a report (**in PDF file format**) that includes:

1. The Crow's Foot ERDs (the initial conceptual database design **and** after mapping the relationships)
2. The logical schema
3. Include a section named "Teamwork Summary", in which the work done by each member must be clearly stated.
4. Besides the above, comment on the difficulties you and your group faced in doing this conceptual design task.

Distribution of marks of Deliverable 1:

| Topic | % |
|----------------------------|-------------|
| Conceptual DB Design (ER) | 30% |
| ER to Relations Conversion | 30% |
| Report Organization | 15% |
| Individual Contribution | 25% |
| Total | 100% |