

Databases

Exercise set 4

Entity-Relationship Modelling

Introduction

A hospital consists of a number of specialized clinics (such as Maternity, Pediatrics, Cardiology, etc). Each clinic has a number of doctors who work in it. Doctors are specialists in some branch of medicine and can be associated with at most one clinic of the hospital. Each clinic hosts a number of patients. On admission, the personal details of every patient are recorded. We also want to store information about medical tests undertaken by a patient, after recommendation of a specialist. A number of tests may be conducted for each patient. In addition, we would like to keep the following information:

For each clinic, a name that uniquely identify it and the total number of rooms in the clinic. A clinic can have more than one doctor who works in it, can have more than one patient, and is managed by exactly one doctor.

For each doctor, a license id which uniquely identifies him or her, the first and last name, the telephone number, the office, and the speciality. A doctor works in only one clinic. We also want to keep the date when the doctor started working in the clinic.

For each patient, we want to record an NI (national insurance) which uniquely identifies a patient, the first and last name, and the gender. A patient can undertake many medical tests and a medical test can be undertaken by many patients. For each patient hosted in a clinic, we also want to keep the date when the patient arrived at the clinic and the date when they left the clinic.

For each medical test, we want to record a test code that uniquely identifies it, a description, a cost, and the result of the test for each patient. The result of a test can be either negative or positive.

Exercise 1

Design an Entity-Relationship Model for the hospital using the notation given in the lectures. Show the multiplicities of the relationships.

If you believe that a rule is missing from the above description, make a reasonable assumption and state this.

Exercise 2

Specify the relational schemas for your database model.

Exercise 3

Write the SQL commands to create the tables and constraints.

You may wish to test your design and your SQL create statements by creating the relations in your own database, inserting some data into the relations and then running some queries.