ASSIGNMENT ONE – DATA MODELLING

INFO90002 - 2018 - SEM1

PARKVILLE GENERAL PRACTICE CLINIC

You are designing the database for an information system to be used by the *Parkville General Practice Clinic*.

PATIENTS

This is a drop-in clinic: no appointments are required. On a patient's first visit they need to self-register into the system by providing their name, gender, home address, contact phone number, email address, date of birth and 20-digit Medicare number. New patients enter this information at a screen in the waiting room, and are issued a numeric patient id on the spot. Patients who have visited the clinic before need not register but can simply sign in by entering their patient id and date of birth at a screen.

Later we will record whether the patient smokes, and any diseases they have: we keep a list of 300 standard disease names for this purpose, and record the date we add or remove a disease from a patient's record. We expect about half a million different patients to attend about 2 million consultations during the life of the clinic.

WAITING ROOM QUEUE

After a patient arrives at the clinic and either registers or signs in, they are added to a software-managed queue, and will sit in the waiting room until called for their consultation with a doctor. When a doctor becomes free, the system calls the next patient in the queue to go to that doctor's office for a consultation. The queue software always chooses the patient who has been waiting longest. We analyse queue data every few months to understand at what times patients arrive at the clinic, how long they typically wait before their consultation, whether any leave before called for a consultation, and how these statistics vary over time.

DOCTORS AND CONSULTATIONS

Twenty doctors currently work for the clinic. We anticipate that about a hundred will be employed over the life of the clinic. On a given day about ten are present to see patients.

We need to record when doctors arrive and leave work, so that we can pay them for the number of hours they work, and so the system knows at any moment who is at work. We assumed that doctors will arrive once and leave once on a given day.

Doctors record the start and end time of each patient consultation. At the end of a consultation the doctor records a set of notes (we should allow them about 200 words for each consultation). By recording the end of a consultation, the doctor signals to the system that they are free for their next patient.

The doctor may write a prescription for the patient to obtain medication, or may require tests to be performed.

PRESCRIPTIONS

A prescription is for one or more medications, for each of which the doctor specifies a dose and frequency (e.g. aspirin, 10 mg, twice a day). Only medications that are in the clinic's list of about five thousand medicines can be prescribed. We keep a record of all prescriptions written.

Prescriptions are usually written during consultations, but can be extended in some circumstances by the patient phoning the clinic. (In the latter case, the duty nurse who takes the call decides whether to extend the prescription or insist that the patient attend a new consultation). When a prescription is extended, the system creates a new prescription record which is linked to the existing one.

RESTRICTED MEDICINES

About 10% of the medications on our list are "Schedule 8" controlled drugs, such as strong painkillers with addictive potential. Prescribing one of these to a patient requires that we ask the government Chief Health Officer for permission. Permission must be granted for each individual prescription of a schedule 8 drug to any patient: if permission is not received we cannot prescribe the drug. We need to keep a record of our requests for permission and the government's responses to these requests.

TESTS AND SAMPLES

During a consultation, the doctor may decide that the patient needs one or more tests to be performed. There is a list of about 100 standard tests (such as "chest x-ray") that doctors can choose from.

Some tests result in one or more medical images needing to be stored, each with a short analysis of around 100 words. Images can be up to 20 Mb in size

A test may require that one or more biological samples be sent to a pathology lab for testing. If this is the case, the doctor will take samples from the patient, recording these in the system and giving each sample a unique identity number and a descriptive note (about 15 words), before sending them to one of 10 pathology labs used by the clinic. Of course we record when and where the samples are sent and when results are received.

Eventually the results of each sample will be received from the lab, in the form of a piece of text (maximum about 500 words). We record the results, and the system automatically send messages to the doctor and patient, telling them that test results are available. We record these messages for later review.

(end of case)