

# Winterbourne Nursing Home – 7COM1022 Advanced Databases



The Winterbourne Nursing Home provides residential and day care services for older people with mental health and physical health problems within the local community. The home can take up to 20 residential patients at any one time but may have many more day patients.

A consultant refers potential residents to the home. Residents are allocated a Primary Nurse who is responsible for ensuring a detailed assessment of the needs of the resident is carried out. The Primary Nurse is part of a team of carers who develop a special caring relationship with the resident so that care needs are met.

Over a period of time the residents are assessed for their mobility, their manual handling, dietary needs and personal hygiene needs.

Records are presently kept using a paper based system. However the home would now like to have a partially computerised system in order to provide a baseline against which improvement and deterioration may be judged.

The home also has day care patients who are also cared for by a Primary Nurse. Day care patients will come to the home on certain days in the week in order to give their families a break from care. These day care patients are not monitored in the same way as the residents and are dropped off in the morning and picked up in the evening. The information relevant to the computerised system is as follows:-

## **All Patients:**

Nursing Home Number - unique for each patient

National Insurance Number

Name

Date of Birth

Religion

The patient's next of kin. The home would like to keep up to three names with addresses and phone numbers.

Each patient has a set of baseline details. This is a recording of the patient's weight, pulse, temperature, and blood pressure and the date these were recorded. The patients will have these baseline details taken once a month. Past readings will have to be kept in order to trace a patient's development over time.

The patient's doctor (G.P.) outside the home, with the address and telephone number.  
The Primary Care Nurse allocated to the patient.

**Day Care Patients:**

Day care patients will have a permanent address and phone number recorded.

Social Worker Name

Weekdays they are at the home – this does not vary from week to week

Expected Arrival Time

Expected Collection Time

**Resident Patients:**

The residents have a range of resident handling assessment criteria which they are assessed against. These are:-

- a) Their sleeping habits need to be recorded. These can be either insomnia, restless, sleepwalks, normal (only one is recorded).
- b) Their mental awareness is recorded on a scale of 1-5. With 1 being poor mental awareness.
- c) Their ability to dress themselves is recorded. These are either; needs complete help, some help, or can dress unaided.
- d) Their mobility is recorded on a scale of 1-5. With 1 being poor mobility.
- e) Their personal hygiene is recorded on a scale of 1-5. With 1 being poor personal hygiene.

The home needs to be able to change the current assessment criteria values if the patient improves or deteriorates and to be able to record the date they were changed.

**Staff:**

The staff number (unique)

Address and Phone numbers

Job type (primary care nurses, care assistants and administrative staff)

The member of staff's next of kin. The home would like to keep up to three names with addresses and phone numbers.



## Part One 30%

1. Draw an Enhanced Entity Relationship diagram for the Winterbourne Nursing home. Show the structural constraints using the minimum and maximum number notation as used in the module. Explain any assumptions you have made, if any. Hand in the diagram with assumptions. (50%) One or two pages.

## Part Two 20%

2. Using the data model-mapping algorithm used in the module, map your extended entity relationship model to a set of relations. (25%) Hand-in the final set of relations (table descriptions). Two or three pages.

## Part Three 25%

3. Based on your relations produced in Part Two above produce a prototype of the system using the Oracle RDBMS (university installation.) Grant access on your tables to your lecturers. (Further information to follow with the required SQL syntax.) Populate some tables with sample data in order to test the queries below:

In order to test the design ensure that your prototype can answer the following queries

- a) Produce a list of the current residential patients at the hospital.
- b) A patient with the name James Gump has gone missing during his daily walk. We need a list of his next-of-kin with telephone numbers.
- c) We now need a report showing Mr Gump's Base Line details from January this year to the present day.
- d) Produce a report showing day care patients, the primary care nurse they have been allocated and the patient's GP.
- e) How many patients had mental awareness scores of 1 or 2 at yesterday's date and are allocated to a GP called Dr J Shipman.

For this section hand-in.

- (a) Your Create Table statements. (Two pages maximum)
- (b) Your SQL statements for the queries above. (Two pages maximum.)
- (c) Results of the queries run with the sample data. ( Four pages maximum)

**On no account hand-in the contents of the tables.** This will be checked on-line.

## Part Four 25%

4. Given your knowledge of NoSQL (unstructured databases) studied in the Advanced Databases course, do you think this is a suitable application for implementation in a NoSQL database? Give the reasons for your choice. Word limit 1,000 words. You will find the conference paper “Introducing NoSQL into the Database Curriculum” useful as well as the lecture notes on this topic.

Hand-in date 9<sup>th</sup> December 2015 by 1400hrs to Computer Science Reception  
Submission on StudyNet before midnight on 9<sup>th</sup> December 2015