IT 340 Assignment2

E-R Model (50 Points)

Due Wednesday, April 21, by 11:59 PM

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You MUST do it in groups with both students in the same section.

Download the document from D2L and change the file name using your MNSU usernames. Keep the following instructions and type your work below.

Upload your document to D2L by the due time.

Everyone is required to create GitHub repository for this course, but I need only one GitHub submission for this project. Add the link of GitHub in the D2L Dropbox description box.

**1. Identify entity types with brief description**

*Example*

*Property: Properties for rent*

* + Wards: where patients are housed
  + Staff: workers at hospital
  + Patients: patients at hospital
  + Patient’s Next of Kin: family members of patients at hospital
  + Local Doctors: doctors that refer patients to the hospital
  + Patient Appointments: appointments to be seen by a hospital consultant
  + Outpatients: past hospital patients not currently at the hospital
  + Inpatients: hospital patients currently at the hospital
  + Patient Medications: information for medications prescribed to patients
  + Surgical and Nonsurgical Supplies: supplies to perform, prepare for, and clean up from surgeries and other medical practices
  + Pharmaceutical Supplies: supplies to relieve pain and sterilize during surgeries and other medical practices
  + Ward Requisitions: forms to obtain supplies from the hospital for use
  + Suppliers: people and companies that provide the hospital with supplies

**2. Identify relationship types with brief description. You must include the multiplicity and attributes if any.** *Example*

*Renter (0..\*) Rents (0..\*) Property*

*Attribute: StartDate, EndDate, Rent*

*One property is rented by one renter at one time.*

*One renter can rent multiple properties at one time.*

*All renting data, including in the past and in the future, are stored.*

1. Patients (1..1) makes (1..\*) Patients Appointments

Patients(PatientNumber, FirstName, LastName, Address, PhoneNumber, DOB, Sex, MaritalStatus, DateRegistered)

One and only one patient can make a one more many appointment.

One appointment and have one and only one patient.

2. Patients Appointments (\*..1) have (1..\*) staff

Patient Appointments: (AppointmentNumber,StaffName, StaffNumber, TimeDate, ExaminationRoom, PatientNumber)

One appointment can include one or many staff

Many staff can have one and only one patient

3. Staff (1..1) can have (1..\*) employee contracts

Employee contract : (Staff Number, Per weekly hours, Contract type, payment Type)

One staff can have many contracts

Many employee contracts will have one staff member

4. Staff (1..1) can have (1..\*) members quantification

Member qualification: (Staff number, date of qualification, type, name of institution)

One staff can have one or many qualifications

Many qualifications can be owned by one staff member

5. Staff (1..1) can have (1..\*) work experience

Work experience: (staff number, organization, position, start date, finish date)

One staff member can have one or many work experiences

Many work experiences can be owned by one staff member

6. Local doctor (1..1) can have (1..\*) patients

Local Doctors: (FullName,ClinicNumber,ClinicAddress,ClinicPhoneNumber,PatientNumber)

One local doctor can habe one patients

Many patients can have one doctors

7. Patients next of kin (1..\*) can have (1..1) patients

Patient's Next of Kin: (FullName, Relationship, Address, PhoneNumber, PatientNumber)

Many Patients next of kin can have one patient at a time

One patient can have one or many Patients next of kin

8. Out Patients (1..1) can have (1..\*) appointment

Outpatients: (PatientNumber,FullName,DOB,Sex,AppointmentDate, Appointmentnumber)

One out Patient can have one or many appointments at a period

Many appointments can be held by one Out Patients

9. In patients ( 1..\*) can have (1..1) patient

Inpatients:(PatientNumber,BedNumber,WaitingDate,WaitingWardNumber,Duration, WardPlacement, WardExpectedLeaveDate, WardLeaveDate)

Many in patients can be one and only one patient at a time

One patient can be an in patient

10. Patients medications (1..\*) will have (1..1) patient

PatientMedication:(FirstName,LastName,PatientNumber,ItemlID,DrugName,MethodofAdministration,StartDate,EndDate)

Many medications can be owned by one patient

One patient can have many medications

11. Ward staff (1..\*) can have (1..1) staff

Ward staff: ( ward number, staff number, roles)

One staff number can be assigned one to many ward staff

Many wards staff can have one staff at a time

12. Wards (1..\*) can have (1..\*) ward staff

Wards: (ward number, ward name, location, total beds, tele-phone number)

many ward can have many ward staff at a time.

Many ward staff can assigned to many wards at a time.

13. Ward requisites (1..\*) can be (1..1) ward

Ward Requisitions:(RequisitesNumber, WardNumber,StaffFirstName,StaffLastName,OrderDate,

ItemsNumber,Units,PerUnitCost,ReceivedDate,ReceivedBy,WardNumber)

Many Ward requisites can have one ward

One ward can have many Ward requisites

14. Surgical and non- surgical supplies (1..1) can have (1..\*) Ward requisites

Surgical and NonsurgicalSupplies:(ItemID,ItemName,ItemType,ItemDescription,QuantityinStock,

ReorderLevel,CostPerUnit,RequisitesNumber)

One Surgical and non- surgical supplies can be in Ward requisites

Many Ward requisites can get Surgical and non- surgical supplies

15. Supplier (1..\*) can supply (1..\*) Surgical and non- surgical supplies

Suppliers:(SupplierlD,SupplierName,SupplierAddress,SupplierPhone,FaxNumber,ItemID)

Many suppliers can supply many Surgical and non- surgical supplies

Surgical and non- surgical supplies can also have many suppliers

16. Pharmaceutical supplies (1..\*) supply (1..\*) Surgical and non- surgical supplies

Pharmaceutical Supplies:(DrugNumber,DrugName,Description,Dosage,MethodofAdministration,

Quantity,ReorderLevel,CostPerUnit,ItemID)

Many Pharmaceutical supplies can supply many Surgical and non- surgical supply

Many Surgical and non- surgical supplies can have many Pharmaceutical supply.

**3. Describe each entity type in detail**

Wards(WardNumber, WardName, Location, TotalBeds, Telephone Number)

PK: WardNumber

Staff(StaffNumber, FirstName, LastName, Address, PhoneNumber, DOB, Sex, NIN, PositionHeld, CurrentSalary, SalaryScale, AppointmentNumber)

PK: StaffNumber, FK: Appointment Number

Patients(PatientNumber, FirstName, LastName, Address, PhoneNumber, DOB, Sex, MaritalStatus, DateRegistered)

PK: PatientNumber

Patient’s Next of Kin:(FullName,Relationship,Address,PhoneNumber,PatientNumber)

PK: FullName, FK: PatientNumber

Local Doctors:(FullName,ClinicNumber,ClinicAddress,ClinicPhoneNumber,PatientNumber)

PK: ClinicNumber, FK: PatientNumber

Patient Appointments:(AppointmentNumber,StaffName,StaffNumber,TimeDate, ExaminationRoom, PatientNumber)

PK: AppointmentNumber, FK: StaffNumber,PatientNumber

Outpatients:(PatientNumber,FullName,DOB,Sex,AppointmentDate,Appointmentnumber)

PK: FullName, FK: PatientNumber,AppointmentNumber

Inpatients:(PatientNumber,BedNumber,WaitingDate,WaitingWardNumber,Duration,WardPlacement, WardExpectedLeaveDate,WardLeaveDate)

PK: BedNumber, FK: PatientNumber

Patient Medication:(FirstName,LastName,PatientNumber,ItemID,DrugName,MethodofAdministration, StartDate,EndDate)

PK: , FK: PatientNumber,ItemID

Surgical and Nonsurgical Supplies:(ItemID,ItemName,ItemType,ItemDescription,QuantityinStock, ReorderLevel,CostPerUnit,RequisitesNumber)

PK: ItemNumber, FK: RequisitesNumber

Pharmaceutical Supplies:(DrugNumber,DrugName,Description,Dosage,MethodofAdministration, Quantity,ReorderLevel,CostPerUnit,ItemID)

PK: DrugNumber, FK: ItemID

Ward Requisitions:(RequisitesNumber,WardNumber,StaffFirstName,StaffLastName,OrderDate, ItemsNumber,Units,PerUnitCost,ReceivedDate,ReceivedBy,WardNumber)

PK: RequisitesNumber, FK: WardNumber

Suppliers:(SupplierID,SupplierName,SupplierAddress,SupplierPhone,FaxNumber,ItemID)

PK: SupplierID, FK: ItemID

**4. Draw the E-R diagram**

Show the primary key for each table.

You must specify the multiplicity on the E-R diagram.

IT 340 – Project

Consider the following case study, you are to build a relational database for Wellmeadows Hospital.

This case study describes a small hospital called Wellmeadows, which is located in Edinburgh. The Wellmeadows Hospital specializes in the provision of healthcare for elderly people. Listed below is a description of the data recorded, maintained, and accessed by the hospital staff to support the management and day to day operations of the hospital.

**Wards**

The Wellmeadows Hospital has 17 wards with a total of 240 beds available for short and long stay patients, and an outpatient clinic. Each ward is uniquely identified by a number (i.e. - ward 11) and also a ward name (i.e. - Orthopedic), location (i.e. - E block), total number of beds, and a telephone extension number (i.e. - Extn 7711).

**Staff**

The Wellmeadows Hospital has a Medical Director, who has overall responsibility for the management of the hospital. The Medical Director maintains control over the use of the hospital resources (including staff, beds, and supplies) in the provision of cost-effective treatment for all patients.

The Wellmeadows Hospital has a Personnel Officer who is responsible for ensuring that the appropriate number and type of staff are allocated to each ward and the outpatient clinic. The information stored on each staff member includes a staff number, name (first and last), full address, telephone number, date of birth, sex, National Insurance Number (NIN), position held, current salary, and salary scale. It also includes each member’s qualifications (which includes date of qualification, type, and name of institution) and work experience details (which includes the name of the organization, position, and start and finish dates). The type of employment contract for each member of staff is also recorded, including the number of hours worked per week, whether the staff member is on a temporary or permanent contract, and the type of salary payment (weekly/monthly).

Each ward and the outpatient clinic has a member of staff with the position of Charge Nurse. The Charge Nurse is responsible for overseeing the day to day operations of the ward/clinic. The Charge Nurse is allocated a budget to run the ward and must ensure that all resources are used effectively in the care of patients. The Medical Director works closely with the Charge Nurses to ensure the effective running of the hospital. A Charge Nurse is responsible for setting up a weekly staff rotation, and must ensure that the ward/clinic has the correct number and type of staff on duty at any time during the day or night. In a given week, each staff member is assigned to work an early, late, or night shift.

As well as the Charge Nurse, each ward is allocated senior and junior nurses, doctors, and auxiliaries. Specialist staff (i.e. – consultants, physiotherapists) are allocated to several wards or the clinic.

**Patients**

When a patient is first referred to the hospital, he or she is allocated a unique patient number. At this time, additional details of the patient are also recorded including the name (first and last), address, phone number, date of birth, sex, marital status, date registered with the hospital, and the details of the patient’s next of kin.

**Patient’s Next of Kin**

The details of a patient’s next of kin are recorded, which includes the next of kin’s full name, relationship to the patient, address, and phone number.

**Local Doctors**

Patients are normally referred to the hospital by their local doctor. The details of local doctors are held, including their full name, clinic number, clinic address, and clinic phone number. The clinic number is unique throughout the U.K.

**Patient Appointments**

When a patient is referred to by his or her doctor, the patient is given an appointment for examination by a hospital consultant. Each appointment has a unique number. The details of each patient’s appointment are recorded and include the name and staff number of the consultant undertaking the examination, the date and time of the appointment, and the examination room.

As a result of the examination, the patient is either recommended to attend the outpatient clinic or is placed on a waiting list until a bed can be found in an appropriate ward.

**Outpatients**

The details of outpatients are stored and include the patient number, name (first and last), address, phone number, date of birth, sex, and the date and time of the appointment at the outpatient clinic.

**Inpatients**

The Charge Nurse and other senior medical staff are responsible for the allocation of beds to patients on the waiting list. The details of patients currently placed in a ward and those on the waiting list for a place on a ward are recorded. This includes the patient number, name (first and last name), address, telephone number, date of birth, sex, marital status, the details of the patient’s next-of-kin, the date placed on the waiting list, the ward required, expected duration of stay (in days), date placed in the ward, date expected to leave the ward, and the actual date the patient left the ward, when known. When a patient enters the ward, he or she is allocated a bed with a unique bed number.

**Patient Medication**

When a patient is prescribed medication, the details are recorded. This includes the patient’s name and number, drug number and name, units per day, method of administration (for example, oral, intravenous (IV)), start and finish date. The medication (pharmaceutical supplies) given to each patient is monitored.

**Surgical and Nonsurgical Supplies**

The Wellmeadows Hospital maintains a central stock of surgical (for example, syringes, sterile dressings) and non-surgical (for example, plastic bags, and aprons) supplies. The details of surgical and non-surgical supplies include the item number and name, item description, quantity in stock, reorder level, and cost per unit. The item number uniquely identifies each type of surgical or non-surgical supply. The supplies used by each ward are monitored.

**Pharmaceutical Supplies**

The hospital also maintains a stock of pharmaceutical supplies (for example, antibiotics, and painkillers). The details of pharmaceutical supplies include drug number and name, description, dosage, method of administration, quantity in stock, reorder level, and cost per unit. The drug number uniquely identifies each type of pharmaceutical supply. The pharmaceutical supplies used by each ward are monitored.

**Ward Requisitions**

When required, the Charge Nurse may obtain surgical, non-surgical, and pharmaceutical supplies from the central stock of supplies held by the hospital. This is achieved by ordering supplies for the ward using a requisition form. The information detailed on a requisition form includes a unique requisition number, the name of the member of staff placing the requisition, and the number and name of the ward. Also included is the item or drug number, name, description, dosage and method of administration (for drugs only), cost per unit, quantity required, and date ordered. When the requisitioned supplies are delivered to the ward, the form must be signed and dated by the Charge Nurse who initiated the order.

**Suppliers**

The details of the suppliers of the surgical, non-surgical, and pharmaceutical items are stored. This information includes the supplier’s name and number, address, telephone, and fax numbers. The supplier number is unique to each supplier.

Here are some helpful figures illustrating the tables:

