## 

**APT1050B: Database Management Systems**

**Assignment #1 (Written Assignment):**

**Given on: 18th May 2022;**

**Due: 31st May 2022;**

**Instructor: Gerald Chege, PhD**

**Project Case: Mountain View Community Hospital**

**Project Description:**

After completing a course in database management, you have been hired as an intern by Mountain View Community Hospital. Your first assignment is to work as part of a team of three persons to develop a high-level E-R diagram for the hospital. You conduct interviews with a number of hospital administrators and staff to identify the key entities for the hospital. After a short time your team has identified the following entities:

* **Ward** – a treatment center within hospital. Examples of wards are maternity and emergency care. Each ward has a ward number (identifier) and a ward name.
* **Patient** – a person who is either admitted to the hospital or is registered in an outpatient program. Each patient has a patient number (identifier) and name.
* **Physician** – a member of the hospital medical staff who may admit patients to the hospital and who may administer medical treatments. Each physician has a physician ID (identifier) and name.
* **Bed** – a hospital bed that may be assigned to a patient who is admitted to the hospital. Each bed has a bed number (identifier), a room number, and a ward number.
* **Item** – any medical or surgical item that may be used in treating a patient. Each item has an item number (identifier), description, and unit cost.
* **Employee** – any person employed as part of the hospital staff. Each employee has an employee number and name.
* **Treatment** – any test or procedure performed by a physician on behalf of a patient. Each treatment has a treatment ID that consists of two parts: treatment number, and treatment name.

The team next recorded the following information concerning relationships:

* Each hospital employee is assigned to work in one or more wards. Each ward has at least one employee, and may have any number of employees. The hospital records the number of hours per week that a given employee works in a particular ward.
* Each ward has exactly one employee who is designated nurse in charge for that ward.
* A given patient may or may not be assigned to a bed (since some patients are outpatients). A bed may or may not be assigned to a patient.
* A patient must be referred to the hospital by exactly one physician. A physician may refer any number of patients, or may not refer any patients.
* Physicians may perform any number of treatments on behalf of any number of patients, or may not perform any treatments. A patient may have treatments performed by any number of physicians. For each treatment performed on behalf of a given patient by a particular physician, the hospital records the following information: treatment date, treatment time, and results.
* A patient may optionally consume any number of items. A given item may be consumed by one or more patients, or may not be consumed. For each item consumed by a patient, the hospital records the following: date, time, quantity, and total cost (which can be computed by multiplying quantity times unit cost).

**Required**

This is a written assignment where you are required to answer the Project Questions below and then draw the ER diagram in the Project Exercise section

**Part I - Project Questions:**

1. Why would Mountain View Community Hospital want to use entity-relationship modeling to understand its data requirements? What other ways might the hospital want to model its information requirements?

2. Do there appear to be any weak entities in the description of the Mountain View Community Hospital data requirements? If so, what are they?

3. What is the significance in developing an E-R diagram for the Mountain View Community Hospital to the third entry in the preceding list, which states that some patients are assigned to a bed, but outpatients are not assigned to a bed?

4. Is Mountain View Community Hospital itself an entity type in a data model to represent its data requirements?

**Part II - Project Exercise:**

Develop an Entity Relationship Diagram for Mountain View Community Hospital case described above. State any assumptions you had to make in developing the data model. Use Microsoft Visio (or any other equivalent tool, e.g. Lucidchart) to model this hospital case. Ensure your name is embedded in the design tool as part of the ERD.

For submission purposes, capture all your ERD design screen-shots including the tool’s GUI and paste them into a single word/pdf document containing both Part I and II. Only a word/pdf document with your name embedded in the screenshots is a valid submission.

Submit the assignment via the provided Blackboard submission link by the stated date. You will find the said link inside the page pointed to by the Labs and Assignments link in the APT1050B course home page.

Do NOT copy from a colleague or share your work, to avoid failing the assignment.