

Database Management Systems (DBMS-1000)

Assignment #9 – Normalization

Consider the following database table (Primary key given):

Case	
PK	<u>CaseID</u>
	AdmitDate ReleaseDate HospitalStayDays PatientID PatientName Street City Province PostalCode RoomNo RoomRate TreatmentID TreatmentDesc TreatmentCost AmountOwing

In the table:

- CaseID is a number assigned every time a patient is admitted to the hospital. CaseID values are never reused.
- AdmitDate: It is the date when the patient is admitted to the hospital
- Release Date: Date patient actually released from the hospital. While in the hospital, this value is NULL.
- HospitalStayDays: Estimated number of days the patient is in the hospital for treatment. This estimate is provided by the physician(s) on the case and may or may not be correct.
- PatientID is a number unique to each patient
- PatientName: Name of this patient
- Street: Number and street where patient lives
- City: The city where this street is located
- Province: Province where this city is located
- PostalCode: Postal code of the patient
- RoomNo: Is the room where the patient is kept
- RoomRate: The rate charged for every day the patient is in the room.
- TreatmentId: A number that represents the type of treatment the patient is receiving
- TreatmentDesc: A textual description of the treatment
- TreatmentCost: The cost of the treatment
- AmountOwing: The amount the patient owes based on his/her sickness after being discharged from the hospital

A sample of potential data can be [seen here](#).

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Other Notes:

- A patient may return to this hospital several times for treatment. Each visit (case) is considered a separate event and history must be maintained.
- There may be more than one patient in a room but each patient is kept in one room only.
- Each case is being treated for one or more sicknesses.
- Patient is charged based on the treatment cost(s) and the actual number of days in hospital.
- Patient Case history is kept. If a patient returns to the hospital in the future, a new Case record is created (existing information is retained for medical history purposes).

If the cardinality for a relationship is not provided, analyze the relationship and come up with what you think is appropriate. You may also make any other assumption(s) you think are necessary **HOWEVER - any assumptions must be verified by the user (instructor) who has final say on how to proceed. This approval should be obtained as soon as possible.**

Do the following:

1. Normalize the tables given above. Identify exactly what must be done in each step of the normalization process and why. Fully explain creation of any new entities and the columns they contain along with explanations of why you discard any columns. (You may find it useful to draw the ERD as you normalize). If there is nothing to be done for a particular step, indicate that as well.
2. Resolve 2 time anomalies (once you have finished placing the tables in 3rd normal form). Fully explain what you must do to resolve these anomalies. The anomalies are:
 - a. The Room Rate may change over time; however the patient is quoted the rate they will pay when admitted.
 - b. Treatment Costs change over time; however the patient is quoted treatment cost(s) they will pay upon admission.
3. Draw the Full Attribute ERD's of the **fully normalized** data model (including revisions required to resolve the time anomaly). Make sure that ALL possible relationships and entities are shown on the ERD.

Note: See the [Rubric](#) for this assignment to see how you will be evaluated.

Submission Instructions:

- The file must be an Excel document. (Copy the ERD from Visio and paste it into this document). No other type of file is acceptable.
- DO NOT compress the file into any sort of archive, submit the Word document directly to the appropriate LEARN drop box.
- Submission of an incorrect file type may result in no feedback (if the submitted file type cannot be easily marked up), or a mark of zero if the instructor is unable to open the invalid file type submitted.