Programming Assignment Unit 4

University of the People

CS 2203 Databases 1

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Programming Assignment Unit 4

I designed these relations below for the hospital MS in the previous programming assignment.

Doctor Relation		
Attributes	**Description**	**Type**
Doctor_ID	It is the primary key of Doctor relation, it should be • Entity integrity constraint • Null constraint • Unique constraint	Numeric
Name	• Null constraint	Text
Phone	• Null constraint	Numeric
Specialty	• Null constraint	Text
Specialty_Num	• Null constraint	Numeric
Supervisor_ID	• Null constraint	Numeric

Patient Relation		
Attributes	**Description**	**Type**
Patient_ID	It is the primary key of Patient relation, it should be • Entity integrity constraint • Null constraint • Unique constraint	Numeric
Name	• Null constraint	Text
Phone	• Null constraint	Numeric
Email	• No constraint	Text

Address	• Null constraint	Text
Added_date	• Null constraint	Date
Allergies	• No constraint	Text
Doctor_ID	• Null constraint • Referential integrity constraint	Numeric

Appointment Relation		
Attributes	**Description**	**Type**
Appointment_ID	It is the primary key of Appointment relation, it should be • Entity integrity constraint • Null constraint • Unique constraint	Numeric
Doctor_ID	• Null constraint • Referential integrity constraint	Numeric
Patient_ID	• Null constraint • Referential integrity constraint	Numeric
Date	• Null constraint	Date
Blood_Pressure	• Null constraint	Numeric
Weight	• Null constraint	Numeric
Treatment_Notes	• Null constraint	Text
Medicines	• No constraint	Text

1- Let's define or describe the changes required to get the relations into the 1st normal form.

According to Shahbaz (2015), we know that a relation is in the first normal form if
- The table has a primary key.
- No single column has multiple values.
- The no primary key columns depend on the primary key.

Therefore we have the patient and the appointment relations that have multivalued attributes according to the assignment hint these are allergies, and Medicines respectively. Furthermore, we design tables to contain patient information about allergy and medicine.

Allergy Relation		
Attributes	**Description**	**Type**
Allergy_ID	It is the primary key of Allergy relation, it should be • Entity integrity constraint • Null constraint • Unique constraint	Numeric
Name	• Null constraint	Text

Patient_Allergy Relation		
Attributes	**Description**	**Type**
Allergy_ID	• Entity integrity constraint • Null constraint • Unique constraint • Referential integrity constraint	Numeric
Patient_ID	• Entity integrity constraint • Null constraint	Numeric

	• Unique constraint • Referential integrity constraint	

Medicine Relation		
Attributes	**Description**	**Type**
Medicine_ID	It is the primary key of Medicine relation, it should be • Entity integrity constraint • Null constraint • Unique constraint	Numeric
Allerrgy_Name	• Null constraint	Text

Patient_Medicine Relation		
Attributes	**Description**	**Type**
Appointment_ID	• Entity integrity constraint • Null constraint • Unique constraint • Referential integrity constraint	Numeric
Medicine_ID	• Entity integrity constraint • Null constraint • Unique constraint • Referential integrity constraint	Numeric

2- Let's define or describe the changes required to get the relations into the 2nd normal form.

We know that a relation is in the second normal form if
- The table satisfies 1NF (first normal form).
- Non-primary key attributes depend on all attributes of a composite key.

Therefore, we don't have further changes to the 2nd normal form.

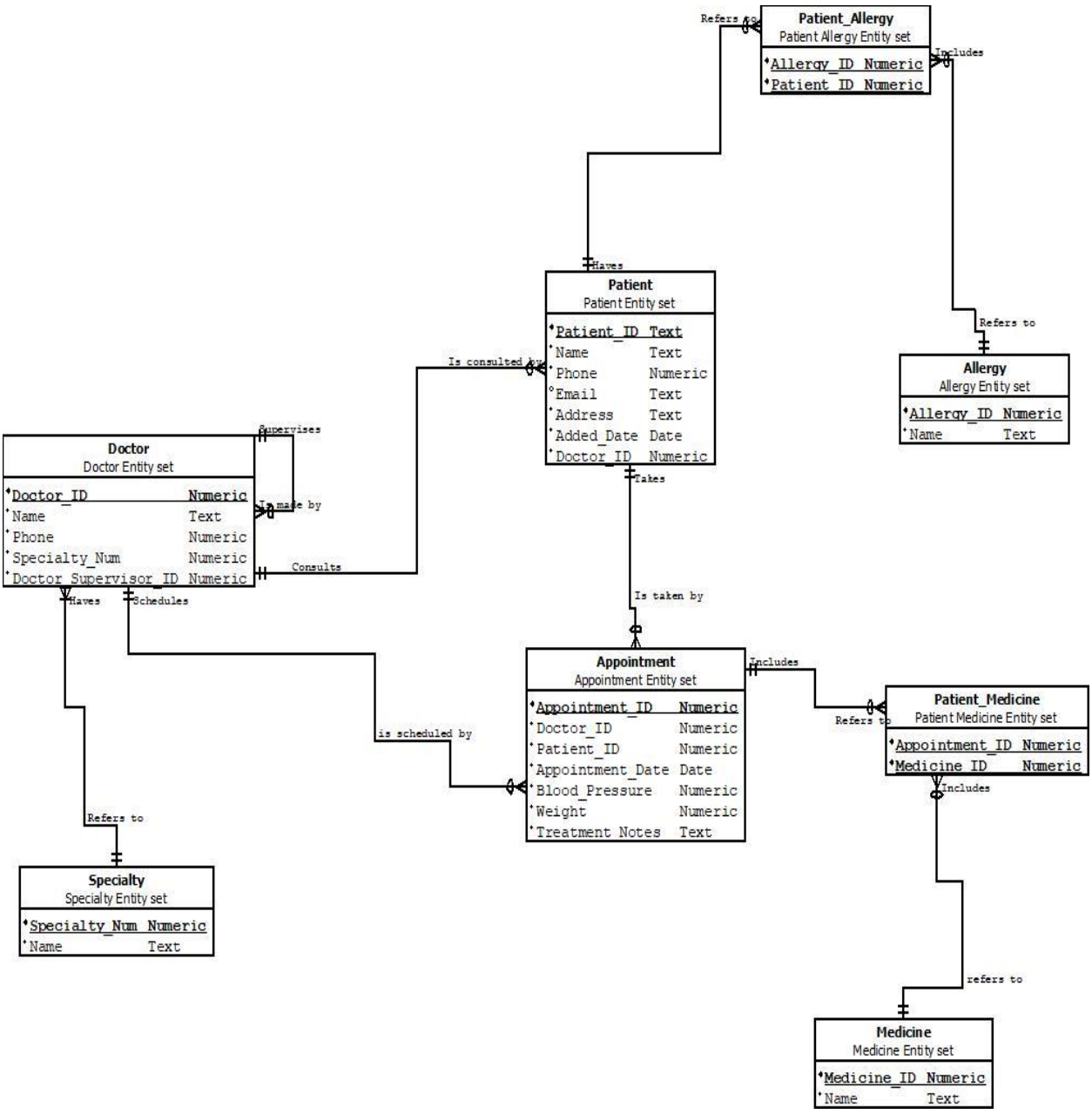
3- Let's define or describe the changes required to get the relations into the 3rd normal form.

We know that a relation is in the third normal form if
- The table meets the criteria for 2NF.
- Each non-primary key attribute in a row does not depend on the entry in another key column.

However, we can make some changes in the Doctor relation because we have a non-primary key that is Specialty_num.

Specialty Relation		
Attributes	**Description**	**Type**
Specialty_Num	It is the primary key of Specialty relation, it should be • Entity integrity constraint • Null constraint • Unique constraint	Numeric
Name	• Null constraint	Text

Finally, as requested by the assignment the Entity-Relationship (ER) Diagram for the third normal form is shown below.



Reference

Shahbaz, Q. (2015, December 22). *Data Mapping for Data Warehouse Design* (1st ed.). Morgan Kaufmann. https://doi.org/10.1016/C2015-0-04423-9