Unit 4 Research Project

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IT525: Database Design and Data Modeling

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Question 1

Find a form on the Web and follow the bottom up database design approach.

1. Find all the attributes on the form.

Last Name, First Name, Last Name, Middle Initial, Student ID, Month, Day, Year (as in birth date), City, State, Zip Code, Phone, E-Mail, U.S Citizen, Visa Type, Fall, Spring, Summer, Destination Institution, Dept/Subj Description, Dept/Subj Code, Course Number, Section Number, Credit Hours, Grade Mode, Course Level, Course Title.

2. Establish the dependencies (determinants).

Attribute	**Depends on (Determinant)**
Student ID	A determinant
First Name	Student ID
Last Name	Student ID
Middle Initial	Student ID
Month Day Year (birth date)	Student ID
City	Zip
State	Zip
Zip	A determinant
Phone	Student ID
E-Mail	Student ID
U.S. Citizen	Student ID
Visa Type	Student ID
Destination Institution	A determinant
Fall	Destination Institution
Spring	Destination Institution
Summer	Destination Institution
Dept/Subj Code	A determinant
Dept/Subj Description	Dept/Subj Code
Course Number	Dept/Subj Code
Section Number	Dept/Subj Code
Credit Hours	Dept/Subj Code
Grade Mode	Dept/Subj Code
Course Level	Dept/Subj Code
Course Title	Dept/Subj Code

3. Group attributes that have a common determinant into an entity type; name it.

	STUDENT
PK	Student ID
	First_Name
	Last_Name
	Middle_Initial
	Birthday
	Phone
	E-Mail
	U.S. Citizen
	Visa Type
FK	Zip

	DESTINATION
PK	Destination_Name_ID
	Fall
	Spring
	Summer
	Dest_Name

	SUBJECT
PK	Subj_Code_ID
	Subj_Description
FK	Course_Name_ID

	ADDRESS
PK	Zip_Code_ID
	City
	State
	Zip

	COURSE
PK	Course_Name_ID
	Course_Name
FK	Section_Number_ID
	Credit_Hours
	Grade_Mode
	Course_Level

	SECTION
PK	Section_Number_ID
	Section_Number
FK	Course_Name_ID

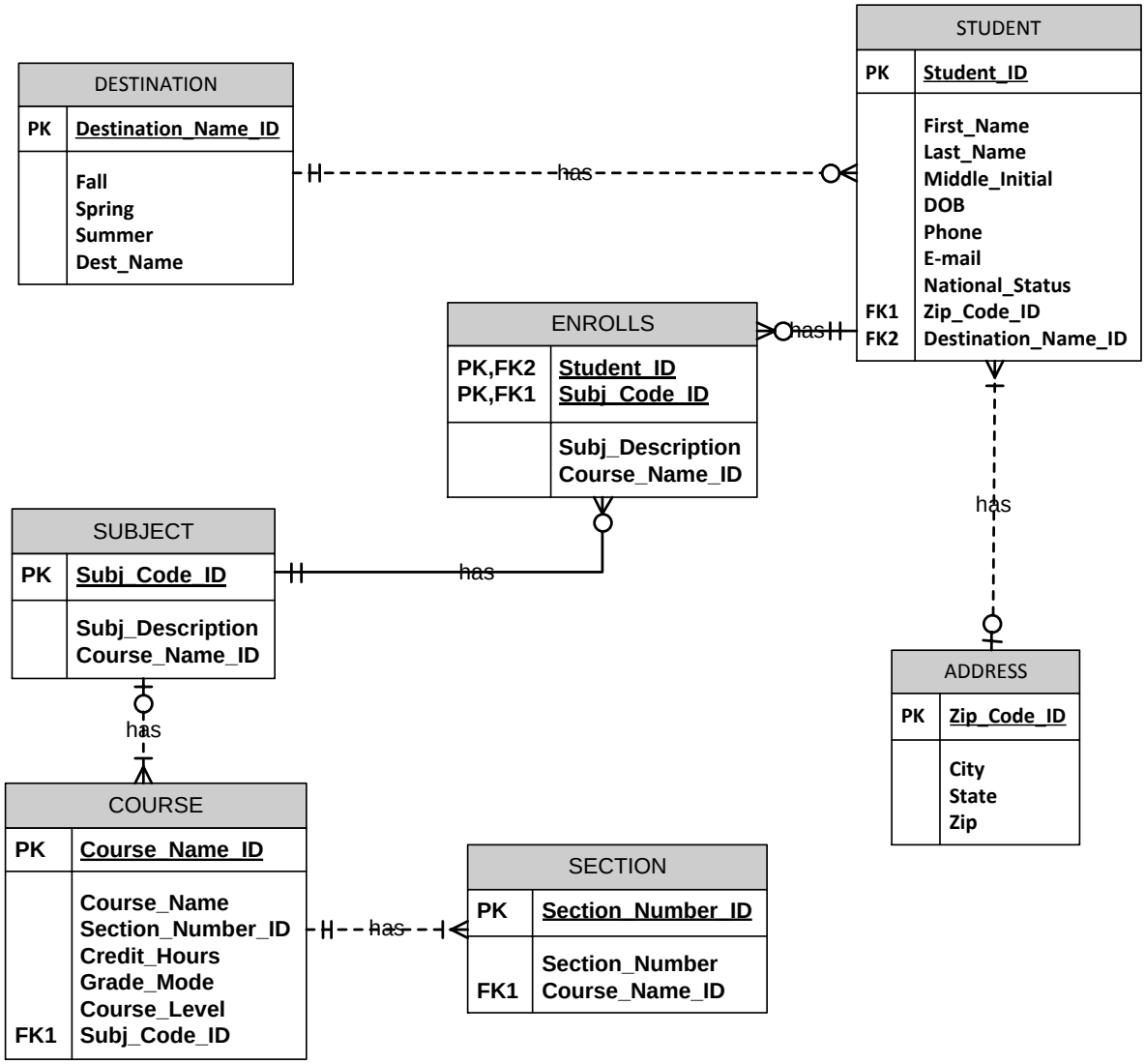
4. Find directly-related entity type pairs.

Student – Address
Student – Destination College
Destination College – Subjects
Subject - Courses
Course – Sections

5. Determine the connectivity for each pair.

One Address may have Many – Students 1:M
One Destination College has Many Students – 1:M
Many Students may have Many Subjects – M:N (this will need a link table)
One Subject has Many Courses – 1:M
One Course may have Many Sections 1:M

6. Draw the ERD.



7. Review the ERD and update to be in 3NF if ERD from step 6 is not in 3NF. ERD has been reviewed, and is in 3NF.

8. URL http://www.slu.edu/Documents/eas/Inter-University_Registration_Form.pdf

Form

SAINT LOUIS UNIVERSITY

Student Information

Name: Last Name First Name Middle Initial

Student ID: Birth Date: Month Day Year

Local Address:

City: State: Zip Code:

Phone: E-Mail: @

U.S Citizen: Yes No If no, Please indicate your Visa Type:

Term and Institution Information

Registration Term: Fall Spring Summer

Destination Institution:

Institution at which you will be taking the course listed below

Course Information

Dept./Subj. Description:

Dept./Subj. Code/#: Course Number: Section Number:

Credit Hours: Grade Mode: Course Level:

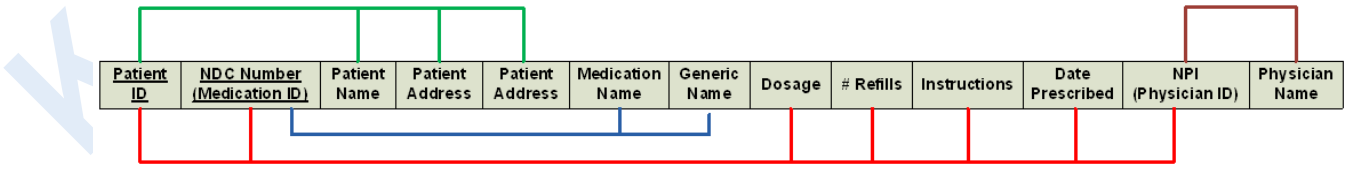
Course Title:

Question 2

Dependency Diagram

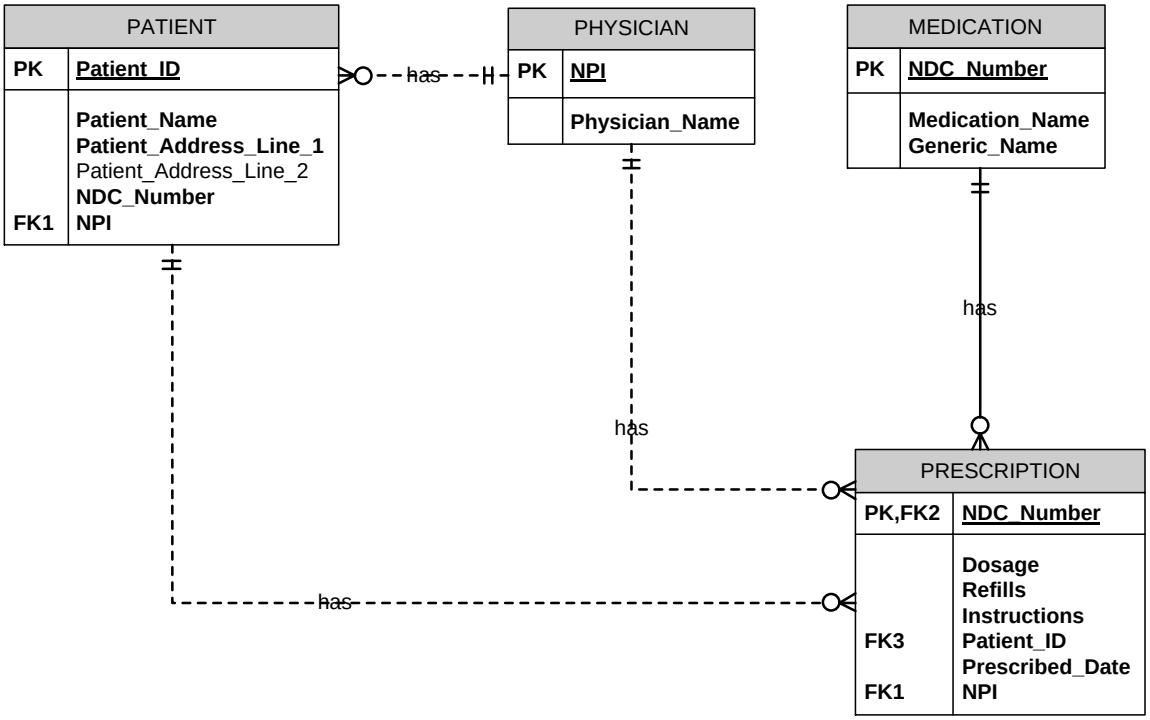
1. Based on the dependency diagram below create an ERD in 2NF but not 3NF showing the dependency diagram.

2a--Physician ID and name should have been left in prescriptions for 2nd NF -3



One Physician can have Many Patients 1:M
One Patient can be prescribed Many Medications 1:M

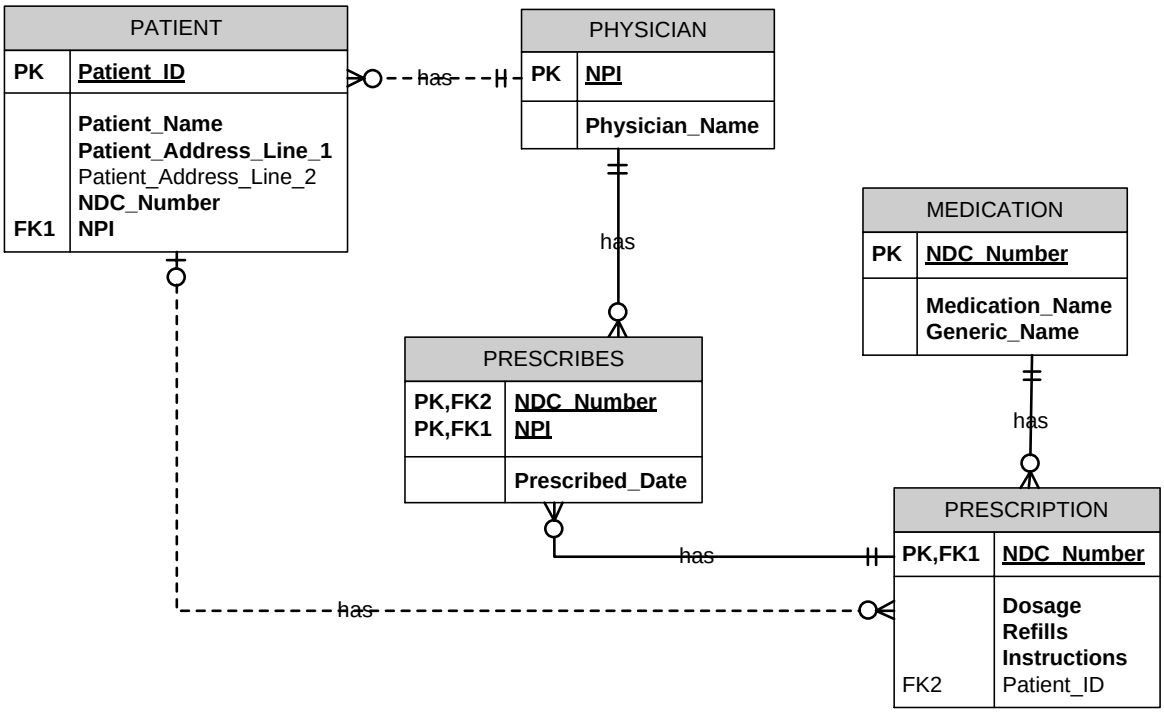
My determinants are: Patient_ID, NPI, and NDC_Number (the NDC is created to meet 2NF).



Based on A, create an ERD in 3NF.

Table prescribes not necessary given the information. -3

2.



References

Coronel, C., Morris, S., & Rob, P. (2012). *Database systems: design, implementation, and management (10th ed.).* Boston, MA: Cengage Learning.