100 Normalization In-Class Exercise Dinner with Answers

Business Systems Analysis and Design (香港浸會大學)

Normalization In-Class Exercise

1. Convert the Big Patient Table into 3rd normal form. The functional dependencies are shown in Table 2 for your reference. Draw the functional dependency diagram, and show the result of each step in the normalization process.

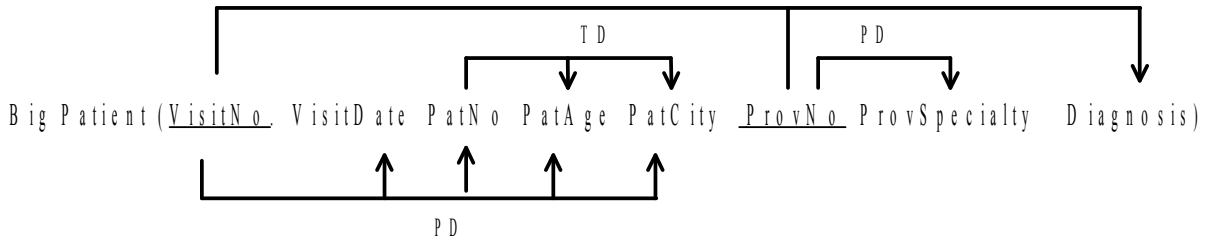
Table 1 Sample Data for the Big Patient Table

VisitNo	**VisitDate**	**PatNo**	**PatAge**	**PatCity**	**ProvNo**	**ProvSpecialty**	**Diagnosis**
V10020	1/13/2007	P1	35	DENVER	D1	INTERNIST	EAR INFECTION
V10020	1/13/2007	P1	35	DENVER	D2	NURSE PRACTIONER	INFLUENZA
V93030	1/20/2007	P3	17	ENGLEWOOD	D2	NURSE PRACTIONER	PREGNANCY
V82110	1/18/2007	P2	60	BOULDER	D3	CARDIOLOGIST	MURMUR

Table 2 Functional Dependency in the Big Patient Table

PatNo → PatAge, PatCity
ProvNo → ProvSpecialty
VisitNo → PatNo, VisitDate, PatAge, PatCity
VisitNo, ProvNo → Diagnosis

Question 1 Answer



1NF
Big Patient (VisitNo., VisitDate, PatNo, PatAge, PatCity, ProvNo, ProvSpecialty, Diagnosis)

2NF
PatientVisit (VisitNo., VisitDate, PatNo, PatAge, PatCity)
Provider (ProvNo, ProvSpecialty) [Already in 3NF]
VisitProvDiagnosis(VisitNo., ProvNo, Diagnosis) [Already in 3NF]

3NF
Patient (PatNo, PatAge, PatCity)
PatientVisit (VisitNo., VisitDate, PatNo)
Provider (ProvNo, ProvSpecialty)
VisitProvDiagnosis(VisitNo., ProvNo, Diagnosis)

The manager of a company dinner club would like to have an information system that assists him to plan the meals and to keep track of who attends the dinners, and so on.

Because the manager is not an IS expert, the following table is used to store the information. As a member can attend many dinners and a member will not attend more than 1 dinner on the same date, the primary key of the following table is Member Num + Dinner Num. Dinners can have many courses, from one-course dinner to as many courses as the chef desired.

MEMBER NUM	MEMBER NAME	MEMBER ADDRESS	DINNER NUM	DINNER DATE	VENUE CODE	VENUE DESCRIPTION	FOOD CODE	FOOD DESCRIPTION
214	Peter Wong	325 Meadow Park	D0001	15-Mar-10	B01	Grand Ball Room	EN3	Stuffed crab
							DE8	Chocolate mousse
235	Mary Lee	123 Rose Court	D0002	15-Mar-10	B02	Petit Ball Room	EN5	Marinated steak
							DE8	Chocolate mousse
250	Peter Wong	9 Nine Ave	D0003	20-Mar-10	C01	Café	SO1	Pumpkin soup
							EN5	Marinated steak
							DE2	Apple pie
235	Mary Lee	123 Rose Court	D0003	20-Mar-10	C01	Café	SO1	Pumpkin soup
							EN5	Marinated steak
							DE2	Apple pie
300	Paul Lee	123 Rose Court	D0004	20-Mar-10	E10	Petit Ball Room	SA2	Apple pie

* This table has only 5 records.

a. Use proper notation to write down the above table. Use “Member Dinner” as the table name.
b. Convert the above Member Dinner table into 1st Normal Form table.
c. Assuming you can identify the functional dependencies from the table; draw a functional dependencies diagram for the 1st NF table.
d. Develop a set of 3NF tables. Show every step of normalization along the way.

a.

Member Dinner (MEMBER NUM, MEMBER NAME, MEMBER ADDRESS, DINNER NUM, DINNER DATE, VENUE CODE, VENUE DESCRIPTION, 1{FOOD CODE, FOOD DESCRIPTION}n)

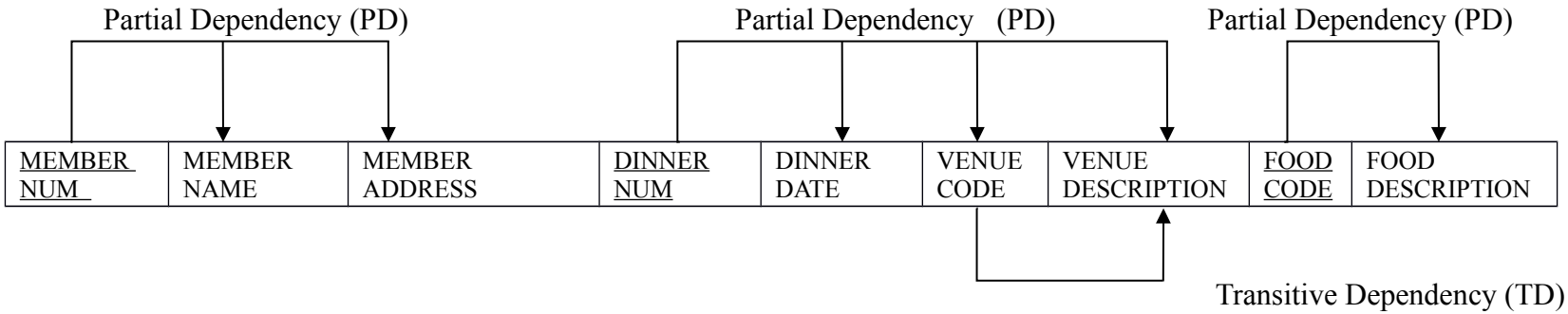
b. The First Normal Table is:

Member Dinner Food (MEMBER NUM, MEMBER NAME, MEMBER ADDRESS, DINNER NUM, DINNER DATE, VENUE CODE, VENUE DESCRIPTION, FOOD CODE, FOOD DESCRIPTION)

Note: The following table is not part of the answer. I put it here just to help you understand.

MEMBER NUM	MEMBER NAME	MEMBER ADDRESS	DINNER NUM	DINNER DATE	VENUE CODE	VENUE DESCRIPTION	FOOD CODE	FOOD DESCRIPTION
214	Peter Wong	325 Meadow Park	D0001	15-Mar-10	B01	Grand Ball Room	EN3	Stuffed crab
214	Peter Wong	325 Meadow Park	D0001	15-Mar-10	B01	Grand Ball Room	DE8	Chocolate mousse
235	Mary Lee	123 Rose Court	D0002	15-Mar-10	B02	Petit Ball Room	EN5	Marinated steak
235	Mary Lee	123 Rose Court	D0002	15-Mar-10	B02	Petit Ball Room	DE8	Chocolate mousse
250	Peter Wong	9 Nine Ave	D0003	20-Mar-10	C01	Café	SO1	Pumpkin soup
250	Peter Wong	9 Nine Ave	D0003	20-Mar-10	C01	Café	EN5	Marinated steak
250	Peter Wong	9 Nine Ave	D0003	20-Mar-10	C01	Café	DE2	Apple pie
235	Mary Lee	123 Rose Court	D0003	20-Mar-10	C01	Café	SO1	Pumpkin soup
235	Mary Lee	123 Rose Court	D0003	20-Mar-10	C01	Café	EN5	Marinated steak
235	Mary Lee	123 Rose Court	D0003	20-Mar-10	C01	Café	DE2	Apple pie
300	Paul Lee	123 Rose Court	D0004	20-Mar-10	E10	Petit Ball Room	SA2	Apple pie

c.



d.

Second Normal Form:

Member Dinner Food (MEMBER NUM, DINNER NUM, FOOD CODE) (already in 3NF)

Member (MEMBER NUM, MEMBER NAME, MEMBER ADDRESS) (already in 3NF)

Dinner (DINNER NUM, DINNER DATE, VENUE CODE, VENUE DESCRIPTION)

Food (FOOD CODE, FOOD DESCRIPTION) (already in 3NF)

Third Normal Form:

Member Dinner Food (MEMBER NUM, DINNER NUM, FOOD CODE)

Member (MEMBER NUM, MEMBER NAME, MEMBER ADDRESS)

Dinner (DINNER NUM, DINNER DATE, VENUE CODE)

Food (FOOD CODE, FOOD DESCRIPTION)

Venue (VENUE CODE, VENUE DESCRIPTION)