AACS3013

# TUTORIAL 10

## NORMALIZATION

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Name :

Class :

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## OBJECTIVES

To provide students with understanding of normalization process and see the effect on database design

## PLEASE ANSWER ALL QUESTIONS

### QUESTION 1

Dream Sdn Bhd is a tour agency is using traditional file-based system to manage and maintain all records of their customers' bookings. TourPackages Table shown below is an example of data file stored in their system.

**TourPackages Table**

| Package Code | Package Desc | Price (RM) | Tour Guide | T_Guide Contact | Cust No | Cust Name | Cust Phone | Depart Date |
|---|---|---|---|---|---|---|---|---|
| C123 | 8 days Shanghai | 3800 | Andy | 011124563 | M54 | Mary W | 016112312 | 05-07-15 |
| | | | | | S11 | Su Si | 012456567 | 05-07-15 |
| | | | | | G05 | Gary Lim | 012456678 | 05-07-15 |
| | | | | | Y02 | Yumiko | 011225436 | 05-07-15 |
| T007 | 10 days Turkey | 6200 | Sally | 012569563 | B12 | Braham | 011235645 | 15-08-15 |
| E236 | 10 days UK, France | 12000 | Brian | 012870900 | M54 | Mary W | 016112312 | 08-04-15 |
| | | | | | S11 | Su Si | 012456567 | 08-04-15 |
| | | | | | S54 | Susan | 017235646 | 08-04-15 |
| | | | | | N37 | Natalie | 012456465 | 08-04-15 |
| | | | | | B77 | Kate S | 016458965 | 08-04-15 |
| J560 | 6 days Tokyo, Osaka | 4300 | Yuki | 016258836 | Y02 | Yumiko | 011225436 | 02-05-15 |
| | | | | | A39 | Andrew | 013455667 | 02-05-15 |

(a) Based on the sample data given in the table, discuss each of the following data anomalies with a specific example:

- Insertion anomaly
- Modification anomaly
- Deletion anomaly

(b) Normalize the table given below to a set of third normal form (3NF) relations using DBDL format.

## Question 2

Lovely Pet Clinic stores health history records of its customers' pets as shown in the table below:

| VisitNo | petID | petName | owner | visitDate | treatID | treatDesc | dosage | fee |
|---|---|---|---|---|---|---|---|---|
| A101 | 520 | Max | Niny | 13-1-2016 | V01 | Rabies Vaccination | 0.5 ml | 140 |
| A102 | 725 | Ginger | Coco | 21-2-2016 | G20 | LeptoVaccination | 2 ml | 150 |
| | | | | | T12 | Eye Treatment | 100 mg | 90 |
| A103 | 211 | Fatfat | Niny | 13-3-2016 | V01 | Rabies Vaccination | 1 ml | 180 |
| | | | | | T10 | Treat wound | 500mg | 50 |
| | | | | | T05 | Heart worm medicine | 110mg | 120 |
| A104 | 913 | Circle | Coco | 21-1-2016 | V08 | Tetanus Vaccination | 1 ml | 100 |

(a) Based on the sample data above, explain the meaning of functional dependency.

(b) Based on the sample data given in the table, discuss each of the following data anomalies with a specific example:

- Insertion anomaly
- Modification anomaly
- Deletion anomaly

(c) Normalize the table given below to a set of third normal form (3NF) relations using DBDL format.

## Question 3

The table shown below contains facts about patients, health care providers, patients' visits to a clinic, and diagnoses made by health care providers.

| VisitNo | VisitDate | PatNo | PatAge | PatCity | PatZip | ProvNo | ProvSpecialty | Diagnosis |
|---|---|---|---|---|---|---|---|---|
| V20030 | 13/1/2005 | P1 | 35 | Lahat | 31600 | D1 | Internist | Ear Infection |
| V20030 | 13/1/2005 | P1 | 35 | Lahat | 31600 | D2 | Nurse Practioner | Influenza |
| V82020 | 20/1/2005 | P3 | 20 | Tronoh | 32200 | D2 | Nurse Practioner | Pregnancy |
| V73220 | 18/1/2005 | P2 | 62 | Taiping | 34500 | D3 | Cardiologist | Murmur |

Repeating Group

Normalize the table into a set of 3NF relations using DBDL format. Hint: The zip code of the patient can be used to determine the city.

## Question 4

Consider the following Co-curriculum Registration table for a high school. The table contains repeating groups, which can lead to data inconsistency. To resolve this problem, you are required to normalize the table to a set of 3NF relations. Your answer should show all the three (1NF, 2NF, and 3NF) steps of the normalization process by using DBDL.

**Co-curriculum Registration Table**

| CoCu Code | Desc | Advisor No | Advisor Name | StuID ID | Stu Name | Stu Contact | Day | Time |
|---|---|---|---|---|---|---|---|---|
| BA11 | Basketball | A911 | Alan Tan | P213 | May | 245578 | Monday | 5:00pm |
| | | | | P234 | June | 656588 | Monday | 5:00pm |
| | | | | P786 | Wynn | 623918 | Friday | 6:30pm |
| TA20 | Taekwondo | Y012 | Yumiko | P213 | May | 245578 | Sunday | 9:00am |
| | | | | P669 | Hatta | 398897 | Sunday | 9:00am |
| KA07 | Karate | N023 | Naruto | P008 | Wong | 258789 | Tuesday | 7:00pm |
| NE11 | Netball | S56 | Susan Ong | P318 | Sammy | 389965 | Monday | 6:00pm |
| | | | | P234 | June | 656588 | Saturday | 8:00am |