SCHOOL OF
COMPUTER AND SECURITY SCIENCE

AUSTRALIA ECU EDITH COWAN UNIVERSITY

CSG1207/CSI5135: Systems and Database Design
Workshop 02

Background

Databases are made up of tables, or relations. Each table in the database corresponds to a normalised data set. This workshop enables you to practice the process of normalisation, covering 1NF, 2NF and 3NF – resulting in a normalised set of relations. It also tests general knowledge of topics covered in the lecture.

Task 1

Answer the following review questions:

1. Describe the requirements of 1NF and the process needed to reach it from 0NF.
2. Describe the requirements of 2NF and the process needed to reach it from 1NF.
3. Describe the requirements of 3NF and the process needed to reach it from 2NF.
4. What are partial dependencies and transitive dependencies?
5. Why is it useful to use Relational Symbolic Notation (R1, R12, etc) during normalisation?
6. Based on your understanding of normalisation, can insert, update and delete anomalies occur when a set of relations is in 3NF? Explain/Justify your answer.

Task 2

The following unnormalised data set represents the basic university enrolment example from the first lecture. Normalise it to 3NF.

R1 = (Student#, Student Name, **{**Unit Code, Unit Name**})**

Task 3

Normalise the unnormalised data sets from Tasks 2, 3 and 4 of the first workshop to 3NF. If you have not completed the first workshop, do it now or use the solutions provided.

Task 4

Identify the errors in each of the following data sets and relations. State any assumptions that you make in order to validate your answers.

a) ***Relations in 3NF…***

R111 = (Invoice #, Order Date, *Customer #***)**
R112 = (Customer #, Name, Phone, Address**)**
R112 = (*Invoice #*, *Item #*, Order Date, Unit Price**)**
R122 = (Item #, Description, Qty**)**

b) ***An unnormalised data set…***

R1 = (Invoice #, Order Date, {Customer #, Name, Phone, Address, {Item #, Description, Qty, Unit Price}})

c) ***Named relations in 3NF…***

InvoiceCustomer = (Invoice #, Order Date, *Customer #*, Name, Phone, Address**)**
Invoice = (Invoice #, *Customer #***)**
InvoiceItem = (*Invoice #*, *Item #*, Qty**)**
Item = (Item #, Description, Unit Price**)**

d) ***Relations in 2NF…***

R111 = (Invoice #, Order Date, *Customer #*, Name, Phone, Address**)**
R112 = (*Invoice #*, *Item #*, Description, Unit Price, Qty**)**