

CSG1207/CSI5135: Systems and Database Design

Workshop 01

Background

Normalisation is the process by which a flat file (list) of data may be converted into a set of well-structured relations. A set of well-structured relation contain the minimum amount of data redundancy, and allows users to insert, delete and modify rows in a table without producing anomalies, errors or inconsistencies.

When designing a database, an analyst/programmer is often provided with a form, report or spreadsheet that is currently used by an organisation. This format of information may serve the basic needs of the organisation, but does not usually represent a well-structured set of relations and hence often contains redundant data and suffers from anomalies. One form or spreadsheet will usually not represent a single table in a database. By following the steps of normalisation, we can systematically turn a flat file of data into a set of well-structured relations.

Databases are made up of tables, or relations. Each table in the database corresponds to a normalised relation. This workshop enables you to practice creating unnormalised data sets from forms and identifying repeating groups (ONF) – the first step in producing a set of normalised relations. It also tests general knowledge of topics covered in the lecture.

Task 1

Answer the following review questions:

1. Name and describe the five components of a DBMS environment.
2. Define the terms relation, attribute and tuple in the context of relational databases, and match them to the common SQL terminology.
3. Name and describe the three data anomalies.
4. What are primary and foreign keys, and how are they related?
5. What does normalisation aim to achieve?
6. What are derived attributes, and why should they be omitted from data sets?

Task 2

Create an unnormalised data set from the following table:

Cust#	CustName	CustPhone	Plan#	PlanName	Quota	Cost
12343	Mel Camby	95852451	21	NetSurfer Plus	25 / 15	59.95
12255	Leigh Tron	97648154	34	Xtreem ADSL2+	100 / 50	89.95
23782	Tiffany Fuller	95688345	21	NetSurfer Plus	25 / 15	59.95
12322	Barry Howard	95682275	21	NetSurfer Plus	25 / 15	59.95
82373	Alistair Croyden	93658515	15	Budget ADSL1	5 / 2	39.95

Task 3

Create an unnormalised data set from the following form:

<u>Meeting Attendance Form</u>	
Meeting #: 5896	Date / Time: 07/09/13 14:00 Room: 13A
Project Code: DV201	Project Title: WestCorp Mining CMS
Meeting Topic: Weekly Project Status Meeting	
<u>Attendees</u>	
Staff #	Staff Name
10524	Troy Buzzwood
19457	Sam Oxford
13584	Peter Sockington
16433	Jane Eltroin
15784	Jess Partian
13468	Harry Knobs
15548	Michael Hunt
Duration of Meeting: 1hr 10m	

Task 4

Create an unnormalised data set from the following form:

CompuTech – Computer Sales & Services

4800 Baud Street

Sandybridge, WA 6144

Phone: 9376 8264

ABN: 215 745 652

Tax Invoice

Invoice Number: 2152452

Invoice Date: 22/04/2013

Customer Details:

Username: jbloggs

Address: 23 Wood Road

Name: Joe Bloggs

Noranda, WA 6062

Phone: 0425 165 241

Invoice Summary (see below for details):

Amount Due: \$826.94

Due Date: 29/04/13

Invoice Details:

Item #	Item Name	Cat #	Cat Name	Qty	Cost	Subtotal
10045	Virus Removal (Basic)	SVC	Service	1	\$45.00	\$45.00
70325	Seagate Backup Plus Portable HDD (1TB)	HW	Hardware	2	\$149.00	\$298.00
56826	Logitech Keyboard K120	HW	Hardware	1	\$24.95	\$24.95
90564	Microsoft Office Professional 2013	SW	Software	1	\$399.00	\$399.00
80254	Norton Antivirus (1 Year/1 PC)	SW	Software	1	\$59.99	\$59.99

Grand Total	\$826.94
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Note: Quantities of Service (SVC) items represent hours of labour. All prices include GST.