Module 02 Tutorial Session

Question

Based on the un-normalised data set from Tutorial 1, normalise the following invoice to 3NF.

#### From: Joe’s Supplies, 23 Downhill Slope, Welshpit, WA 6543

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Invoice#  12345 | |  | Customer#: 78901 | | |  | | Customer Name:  Fred Bloggs | |  | |  | |
| Date: 29/5/02 | |  | Contact Ph:  08 9370 6111 | | |  | | Customer Address:  3 Uphill Rise,  Ferndale, WA 6303 | |  | |  | |
| Item# | Description | | | Qty | UnitPrice | | GST Code | | GST Rate | Tax | Subtotal | |
| 9898 | Bearing, Ball | | | 25 | $2.50 | | 1 | | 10% | $0.25 | $68.75 | |
| 9999 | Bearing, Roller | | | 10 | $5.00 | | 1 | | 10% | $0.5 | $55.00 | |
| 8888 | Seal, shaft | | | 10 | $3.00 | | 1 | | 10% | $0.30 | $33.00 | |
| 777 | Glasses, Safety | | | 10 | $10.00 | | 0 | | 0% | $0.00 | $100.00 | |
| 1555 | Punch, 5mm | | | 1 | $4.00 | | 1 | | 10% | $0.40 | $4.40 | |

Terms: Payment within 7 days Total: $261.15

**Tutorial 1 Solution**

***0NF***

R1 = (Invoice#, Date, Customer#**,** Customer Name, Customer Address, Contact Ph,

{Item#, Description, Qty, Unit Price, GST Code})

It is also valid to identify invoice details as a repeating group within customer details, as customers can have more than one order:

R1 = (Customer#**,** Customer Name, Customer Address, Contact Ph, {Invoice#, Date,

{Item#, Description, Qty, Unit Price, GST Code}})

**Solution**

This solution uses the **first** solution from Tutorial 1, with a **single** repeating group.

***0NF***

R1 = (Invoice#, Date, Customer#**,** Customer Name, Customer Address, Contact Ph,

{Item#, Description, Qty, Unit Price, GST Code})

***1NF***

~~R1 = (Invoice#, Date, Customer#~~**~~,~~** ~~Customer Name, Customer Address, Contact Ph,~~

~~{Item#, Description, Qty, Unit Price, GST Code})~~

R11 = (**Invoice#**, Date, Customer#**,** Customer Name, Customer Address, Contact Ph)

R12 = (***Invoice#***, **Item#**, Description, Qty, Unit Price, GST Code)

***2NF***

R11 = (**Invoice#**, Date, Customer#**,** Customer Name, Customer Address, Contact Ph)

~~R12 = (~~***~~Invoice#~~***~~,~~ **~~Item#~~**~~, Description, Qty, Unit Price, GST Code)~~

R121 = (***Invoice#***, ***Item#***, Qty)

R122 = (**Item#**, Description, Unit Price, GST Code)

***3NF***

~~R11 = (~~**~~Invoice#~~**~~, Date, Customer#~~**~~,~~** ~~Customer Name, Customer Address, Contact Ph)~~

R121 = (***Invoice#***, ***Item#***, Qty)

R122 = (**Item#**, Description, Unit Price, GST Code)

R111 = (**Invoice#**, Date, *Customer#*)

R112 = (**Customer#,** Customer Name, Customer Address, Contact Ph)

***Final Named Relations***

Invoice (**Invoice#**, Date, *Customer#*)

Customer (**Customer#,** Customer Name, Customer Address, Contact Ph)

InvoiceItem (***Invoice#***, ***Item#***, Qty)

Item (**Item#**, Description, Unit Price, GST Code)

**Solution**

This solution uses the **second** solution from Tutorial 1, with **two** repeating groups.

***0NF***

R1 = (Customer#**,** Customer Name, Customer Address, Contact Ph, {Invoice#, Date,

{Item#, Description, Qty, Unit Price, GST Code}})

***1NF***

~~R1 = (Customer#~~**~~,~~** ~~Customer Name, Customer Address, Contact Ph, {Invoice#, Date~~

~~{Item#, Description, Qty, Unit Price, GST Code}})~~

R11 = (**Customer#,** Customer Name, Customer Address, Contact Ph)

~~R12 = (~~*~~Customer#~~*~~,~~ **~~Invoice#~~**~~, Date, {Item#, Description, Qty, Unit Price, GST Code})~~

R121 = (*Customer#*, **Invoice#**, Date)

R122 = (***Invoice#***, **Item#**, Description, Qty, Unit Price, GST Code)

***2NF***

R11 = (**Customer#,** Customer Name, Customer Address, Contact Ph)

R121 = (*Customer#*, **Invoice#**, Date)

~~R122 = (~~***~~Invoice#~~***~~,~~ **~~Item#~~**~~, Description, Qty, Unit Price, GST Code)~~

R1221 = (***Invoice#***, ***Item#***, Qty)

R1222 = (**Item#**, Description, Unit Price, GST Code)

***3NF***

R11 = (**Customer#,** Customer Name, Customer Address, Contact Ph)

R121 = (*Customer#*, **Invoice#**, Date)

R1221 = (***Invoice#***, ***Item#***, Qty)

R1222 = (**Item#**, Description, Unit Price, GST Code)

(no changes, already in 3NF)

***Final Named Relations***

Customer (**Customer#,** Customer Name, Customer Address, Contact Ph)

Invoice (*Customer#*, **Invoice#**, Date)

InvoiceItem (***Invoice#***, ***Item#***, Qty)

Item (**Item#**, Description, Unit Price, GST Code)

(while the order of relations and attributes may differ, the final relations are the same as for the first solution – this proves that both 0NF forms were valid)