



# **ICT701**

# **Relational Database Systems**

## **Task 2**

**Semester 1, 2019**

## Assessment and Submission Details

**Marks: 40 % of the Total Assessment for the Course**

**Due Date: Midnight Friday, 24<sup>th</sup> May 2019**

Assignments are to be submitted by SafeAssign.

This is a group assessment. A Self and Peer assessment template will need to be completed as part of the assessment

**DO NOT SUBMIT THE ASSIGNMENT TO THE  
COURSE CO-ORDINATOR OR TUTOR.**

Submit your assignment to the link under Assessment -> Task 2 on Blackboard. The submission link will be open a week before the due date. Please follow the submission instructions provided.

The assignment will be marked out of a total of 100 marks and forms 40% of the total assessment for the course. **ALL** assignments will be checked for plagiarism and/or collusion between individuals.

Refer to your Course Outline or the Course Web Site for a copy of the “Student Misconduct, Plagiarism and Collusion” guidelines. [Academic Integrity Information](#).

***Note: Each student MUST be able to produce a copy of their assignment and this copy MUST be produced within 24 hours of it being requested by the Course Co-ordinator. Failure to produce the second copy of the assignment when requested may result in loss of marks or a fail grade for the assignment.***

Requests for an extension to an assignment extension **MUST** be made prior to the date of submission and requests made on the day of submission or after the submission date will only be considered in exceptional circumstances.

## Case Study: Tuff Toys – Ordering and Inventory System

### Background

Tuff Toys is a toy wholesale company which was formed in the 1980s by two brothers and a friend. Robert had considerable experience as a buyer for a competing toy wholesaler in the early 1980s and now spends a considerable amount of time overseas, visiting toy fairs and identifying prospective stock for Tuff Toys. His brother Tom is an experienced accountant who manages the Tuff Toys Head Office and Warehouse. Their friend, Mark Jones, worked as a salesman at the same toy wholesaler as Robert and now heads the sales team for Tuff Toys. All three have equal shares in the business.

In the early months of the year, Mark and his team of salesmen take boxes of sample toys around several South East Queensland toy retailers. They visit both small toy shops and the head offices of the large toyshop chains to display toy samples and take orders on toys to be delivered in later months of the year. Tuff Toys business is seasonal with less sales in the early months of the year, and sales increasing during the year to peak in October-November in preparation for Christmas trade.

The orders are recorded in the salesmen's order books. A sample order can be found in Appendix A. Tuff Toys guarantee to keep their toy prices constant for all customers. Every year the prices of the toys are reviewed. The Order No on the order is the pre-printed number which identifies that particular order. The name of the salesman who took the order is stated under the item Rep. Sales commission is paid when the order is finally sent to and paid for by the customer. Each salesperson has a commission percentage depending on how many years they have worked at Tuff Toys. The date, both at the top and the bottom of the order is the date that the order was taken. The date required, however, is the date when the toy(s) are required by the customer. The Cust. No. is the unique number given to the customer when they first place an order. That number stays with the customer until they no longer become customers of Tuff Toys. The name and address of the customer ordering the toys are recorded. Tuff Toys always bill and deliver to the

same address. The customer can choose a delivery method from a range of methods. Delivery charges are set and are the same for all customers.

After the orders are received at Head Office, Tom's assistant Joan, calculates the quantity of each item ordered and, on the basis of her figures and his estimation of any extra business that is likely to arise, Tom draws up purchase orders for the toys. Toys are either sourced from overseas or domestic suppliers. Allowance must also be made for toys lost through damage and theft in transit. When the toys are delivered to Tuff Toys they are stored in the main warehouse which is in the same building as the Head Office. When the toys are placed on the warehouse shelves, a sticker which shows the item code is attached to the toy by the storeman.

## Invoicing

Public entrance to the warehouse is through the Head Office. As well as taking orders for future delivery, Tuff Toys has direct sales when toy shop owners visit the warehouse, select their goods, and receive their typed invoice on leaving. Any toys picked up at the warehouse are designated as 'pick up'. An example of the invoice can be found in Appendix B. The invoice is basically very similar to the order. However, what may be ordered may not be in stock and therefore will not be in the invoice. Items that are not in stock will be on back order, and when they arrive, a new invoice will be issued for those remaining items. In the invoice, the recommended retail price (RRP) is written, which indicates to customers, the retail price that they should sell the item at.

## Payments

When Tuff Toys accept a new customer, in addition to storing their name and address, they set a credit limit for the customer. Customers' payments for the invoiced items can be paid after the goods are received, up to a maximum of three months. However, customers who have gone over their credit limit, can no longer order any toys until they make a payment. Customers who have not paid by the end of the month, Tuff Toys sends out a balance showing any outstanding amounts. Tom checks these balances monthly to chase up payments. When payments are

made, they are matched with the corresponding invoice. Payment amounts can also be broken down over three months. So, an invoice can be paid over several payments. An example of a balance sent to a customer can be seen in Appendix C.

## **Inventory**

The total number of stock-on-hand is stored in the items record, which is updated each time an item is received or dispatched. The warehouse clerk adds the quantity of stock received to the current total stock-on-hand. The clerk subtracts the quantity of stock dispatched from the stock-on-hand and checks to see if the new stock level is below the minimum stock level allowed. If it is, a notification is sent through to Head Office, where orders are sent to the required suppliers. A stocktake is also conducted manually every six months to ensure what is on record is what is actually there.

## **Volumes**

Tuff Toys have 950 customers in South East Queensland. From January to April, the maximum total number of orders can reach up to 5,000, with an average of 12 items in each order. In the busy months of October to November, the number of orders can be as many as 4,000 per month. Tuff Toys usually stock about 600 different toys.

## **Sales Representatives**

There are a total of 6 salesreps that work for Tuff Toys. An order can only have one salesrep assigned to it. Salesreps are not linked to specific customers, so any salesrep can take orders from anyone. Personal information on each of the salesreps is stored, such as their names, addresses and mobile phone number. In addition, work related information is also stored, which includes hired date, agreed salary plus a commission rate. The commission rate starts at 3% and goes up every year of employment by 1% and is capped at 10%. Commissions are given to the

salesreps at the end of each month. Appendix D provides a sample monthly report of a salesreps commission.

## New System Requirement

Tuff Toys currently use a computer for word processing and spreadsheets. Their business is thriving, and It is becoming difficult to cope at busy times with the large numbers of orders. During the busy period, it is not unusual for visiting customers to be queued for long periods of time, waiting for their invoice. Tuff Toys would therefore like to computerise their ordering, invoicing and their stock-on-hand processes as well as salesrep details. They **do not** require their sourcing of toys to be automated at present.

## Assignment Requirements and Deliverables

### Part A – Submitted as a MS Word Document:

- Entity Relationship Diagram in Crows Foot Notation
- Relational Schema
  - Including Primary and Foreign Keys
  - Including all attributes
  - Normalisation of all entities to 3NF
  - NOTE: the relational schema and ERD can be combined into the one diagram.
- Supplementary Design requirements – for example but not limited to:
  - information on length of identifiers, postcodes, names,
  - data attribute information (compulsory, variable length / type, etc.)
- Any assumptions

### Part B – Submitted as a single plain text file with name <studentNumber>\_sql, containing all your SQL implementation:

- Your Part B MUST work on a MySQL database and be able to be demonstrated

#### SQL code required:

- CREATE TABLE statements for all tables in your ERD including integrity constraints,
- INSERT INTO statements for populating the database:
  - Incorporate the exact 6 Salesrep and 5 Customer details, exactly as given in the sample dataset (create your own email addresses and phone numbers for these 5 customers)
  - Incorporate the exact 10 toys, exactly as given in the sample dataset
  - Incorporate the delivery details, exactly as given in the sample dataset
  - Enter order details for OrderNo 15209 (in Appendix A)
  - Enter invoice details for InvoiceNo 17211 (in Appendix B)
  - Create three new orders
    - Use three different customers with three different delivery methods
    - Each order must have a minimum of 2 different toys ordered
  - Create payment details for InvoiceNo 17211
    - The customer has paid the invoice in full on the 25<sup>th</sup> Feb 2019
  - Data may need to be inserted in a particular order to comply with integrity constraints

- SELECT statement that will return customers who have not placed any orders
  - The details to be included are:
    - customer name, number and address
- SELECT statement that will produce the following invoice data one of your new orders you created above (you will need to have the data in the database for this query):
  - The details to be included are:
    - customer name, number and address,
    - order number,
    - order date,
    - total amount for the order,
      - This should include delivery cost (if applicable) and the item totals (use the function you will create to calculate item total)
- CREATE FUNCTION
  - Create a function that will calculate the order item total (i.e. each line in the order)
    - This should include GST which is 10% of the cost
- CREATE TRIGGER statements:
  - Automatically update the quantity on hand for each item when an order is placed.
  - Automatically updates the customer balance when an order is placed (i.e. increases the amount owing) (Use the function you created to calculate item total calculator)
  - Automatically updates the customer balance when a payment is made (i.e. decreases the amount owing)

## Part C – Self and Peer Assessment template

- Complete and submit the SPA template. Your lecturer will go through how to complete this template. Each student will need to submit a SEPARATE completed form.

## **Required data**

**IMPORTANT NOTE** – the data in the excel spreadsheet provided on Blackboard **MUST be used in your Part B SQL implementation**. A ZERO (0) mark will be awarded for Part B if the data from the supplied excel spreadsheet is not used as part of your SQL implementation.

## **Submission**

This is a group assessment. PART A and PART B are completed in the group and PART C is completed individually. The completed assignment is to be submitted by SafeAssign on or before the due date.

The assignment will be assessed according to the marking sheet available online. Late submission of the assignment will result in a deduction of marks as specified in the course outline.

## **Assignment Return and Release of Grades**

Assignment grades will be available on the course web site within 15 business days after submission at the latest. An electronic assignment marking sheet will be available.

Where an assignment is undergoing investigation for alleged plagiarism or collusion the grade for the assignment and feedback will be withheld until the investigation has concluded.

## Appendix A – Sample Tuff Toys Order

TUFF TOYS		Order
Wholesale Merchants and Manufacturers Representatives P.O. Box 1097 Brisbane 210 Roma Street Fax: (07) 3257-1001 Tel: (07) 3257-1011		
Ordered By:  Cottage Capers Local Store 12 Linkfield Road Mango Hill 4509		Order No: 15209 Rep: Mark Jones Date: 02/01/19 Cust No.:10225 Date Required: 05/02/19
Item Code	Item Description	Quantity
104 142 231	Patton War Kit Trail Chopper Pink Tea Set (20 piece)	10 30 20
Customer signature: _____ Method of Delivery: _____ Circle chosen method: Air Mail   Regular Mail <input checked="" type="radio"/> Courier   Pickup		

## Appendix B – Sample Tuff Toys Invoice

<b>TUFF TOYS</b>								<b>Invoice</b>
Wholesale Merchants and Manufacturers Representatives P.O. Box 1097 Brisbane 210 Roma Street Fax: (07) 3257-1001 Tel: (07) 3257-1011								Invoice No: 17211
Ordered By:  Cottage Capers Local Store 12 Linkfield Road Mango Hill 4509			Order No: 15209 Rep: John Jones Date: 02/01/19 Cust No.:10225 Date Required: 05/02/19					
RRP	Item Code	Item Description	Qty	Price	Total ex GST	GST	Total	
\$10.50 \$25.99	104 142	Patton War Kit Trail Chopper	10 30	\$8.00 \$16.00	\$80.00 \$480.00	8.00 48.00	88.00 528.00	
Note: Pink Tea Set on Back Order. Will be delivered with next order.								Delivery Charge: \$25.50
								Invoice Total: \$641.50
Delivered by Courier				Customer Signature: _____				

## Appendix C – Sample Monthly Customer Balance

Tuff Toys		Customer Monthly Balance	
Cottage Capers Local Store 12 Linkfield Rd Mango Hill 4509		(Cust No: 10225)	
Opening Balance (as of the end of Dec 2018):		\$250 Owing	
Date	Reference (Invoice #)	Debit	Credit
05/01/19	17056		250
10/01/19	17089	300	
18/01/19	17089		300
22/01/19	17101	100	
28/01/19	17101		50
31/01/19	17101		50
Closing Balance:		\$0 Owing	

**Appendix D – Sample Salesperson Monthly Commission Report**

SalesRep ID:366542			
Name: John Jones			
Commission Rate: 7%			
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Date	Customer	Order#	Total Amount
10/01/19	Tania's Toys	14305	\$181.50
22/01/19	Kmart Flagstone	14612	\$510.95
24/01/19	Magic Land	14778	\$1220.00
30/01/19	McCains Dept. Store	14950	\$978.95
22/01/19	Cottage Capers	17101	\$100.00
Total Sales:			\$2991.40
Total Commission:			\$209.40