INF10025 Data Management and Analytics

Task 5 – Pass and Credit

Overview

- In this final set of P and C tasks for the unit you're going to do further activities on ERDs, and SQL.
- For submission, it's same process as the other the other tasks: complete tasks, document them (usually by creating screen grabs) and submit online.
- To get started, download the files **T05P.DOCX** and **T05C.DOCX** from Canvas
- Please note, ALL tasks in each section MUST be completed for you to successfully complete the Pass and/or the Credit Task.
- When complete, generate the files **T05P.PDF** and **T05C.PDF**
- Finally log into Canvas and submit both files into the appropriate weekly tasks.

Pass Level Tasks

Completion Criteria: For the Pass Task to be marked "Complete" four (4) sub-tasks must be marked "Correct".

Pass 5a

Read the following narrative:

> ***Pete's Pools*** *have a number of swimming centres. Each centre has a name, establishment date, and a description. Clients (who have an ID and name) can join one or more of these swimming centres. As a client joins a centre, the date that the client joined is to be recorded.*

- Draw an ERD based on this case study. Fully expand all M:M relationships into M:1 relationships. Do not introduce any surrogate keys. The ERD may be **neatly** hand drawn or can be created in a package such as Visio or draw.io. The symbols in the ERD must conform to the symbols used throughout all ERD lectures this semester. Clearly indicate strong and/or weak entities, all identifiers and all relationship names.
- Scan, Photograph or take a screenshot of the **ERD** and place it in the document named **T05P.DOCX**

Pass 5b

- Convert the ERD that you created in Pass 5a into a Relational Schema.
- Copy and paste the **relational schema** and place it in the document named **T05P.DOCX**

Pass 5c

- Using the Relational Schema you created in Pass 5b write the DDL Create Table statements for each Relation.
- Copy and paste the **code** into the document named **T05P.DOCX**

Pass 5d

- Explain what is meant by **Normalisation.**

- Paste your answer into the document named **T05P.DOCX**

Pass 5e

- The table below is unnormalised. Replace the table by data presented in **1NF**.

CustId	Name	Phone	CarRego	MakeModel	StartDate	ReturnDate
125	John Coles	0401112233	1AU8HK 1LM3AB	Mazda 3 Hyundai i30	31/08/2020 14/11/2020	7/09/2020 21/11/2020
278	Erin Trump	0466121455	1AU8HK 1KA2CA 1CZ8JK 1AU8HK	Mazda 3 Toyota Camry Mazda 3 Mazda 3	12/09/2020 1/10/2020 10/11/2020 26/11/2020	19/09/2020 8/10/2020 12/11/2020 1/12/2020
721	Emma Knox	0423544117	1LM3AB	Hyundai i30	10/09/2020	13/09/2020

- **Paste your answer into the document named T05P.DOCX**

Credit Level Tasks

Completion Criteria: For the Credit Task to be marked "Complete" five (5) sub-tasks must be marked "Correct".

Credit 5a

You're now going to return to the *Pete's Pools* case (see Pass 5a). The business rules have changed. Read the new narrative:

> *Clients may now join and leave and/or re-join any swimming centre. As a result you need to record such information.*

- Adjust your previous ERD. You should not have to create any new entities. Do not introduce any surrogate keys. Indicate all identifiers. The correct identifier is crucial. An incorrect identifier may prohibit customers from re-subscribing to the same magazine again.
- Convert the ERD into a Relational Schema.
- **Create some Test data** (in a Table format – no need to write out Insert statements) :
    - Create three sample clients and three sample swimming centres.
    - Create data that allows clients to join, leave and re-join a swimming centre.
- Scan, Photograph or take a screenshot of the **ERD** and place it in the document named **T05C.DOCX**
- Copy and paste the **Relational schema** and place it in the document named **T05C.DOCX**
- Copy and paste the **Test data** and place it in the document named **T05C.DOCX**

Credit 5b

Read the following narrative:

Tiny's Motorcycle Maintenance is a specialist Harley Davidson mobile mechanic service. Tiny travels to the customer's (who have an Id and a name) chosen place of service. The customer can have more than one motorcycle that Tiny services. Each motorcycle has a Vehicle Identification Number (VIN), a Make, a Model, a Year of manufacture, and an engine capacity measured in cubic centimetres (CC). Each motorcycle during it's life can be owned by many different customers.

When Tiny services a motorcycle he records the date, location of the service, and the Total cost of the service. Tiny also records the tasks he performs (e.g. change engine oil). Each task has a different Hourly Rate.

The spare parts that need replacing are also recorded, together with the price for the part and quantity used (e.g. oil filter and sparkplugs). Many of the tasks performed and the parts required are the same when servicing different motorcycles.

The Total cost for the service is calculated based on cost for each tasks performed (time taken X Hourly Rate), and the cost of parts required (quantity X unit price).

- Draw an ERD based on this case study. Fully expand all M:M relationships into M:1 relationships. Introduce surrogate keys where required. The ERD may be **neatly** hand drawn or can be created in a package such as Visio or draw.io. The symbols in the ERD must conform to the symbols used throughout all ERD lectures this semester. Clearly indicate strong and/or weak entities, all identifiers and all relationship names.
- Scan, Photograph or take a screenshot of the **ERD** and place it in the document named **T05C.DOCX**

Credit 5c

- Convert the ERD from Credit 5b into a Relational Schema
- Copy the **Relational Schema** into the document named **T05C.DOCX**

Credit 5d

- Using the Relational Schema you created in Credit 5c write the DDL Create Table statements for each Relation.
- Copy and paste the **code** into the document named **T05C.DOCX**

Credit 5e

- Refer back to the pass 5i task. You were given the table below and replaced it with 1NF. Starting with that solution present the data in 3NF.

CustId	Name	Phone	CarRego	MakeModel	StartDate	ReturnDate
125	John Coles	0401112233	1AU8HK 1LM3AB	Mazda 3 Hyundai i30	31/08/2020 14/11/2020	7/09/2020 21/11/2020
278	Erin Trump	0466121455	1AU8HK 1KA2CA 1CZ8JK 1AU8HK	Mazda 3 Toyota Camry Mazda 3 Mazda 3	12/09/2020 1/10/2020 10/11/2020 26/11/2020	19/09/2020 8/10/2020 12/11/2020 1/12/2020
721	Emma Knox	0423544117	1LM3AB	Hyundai i30	10/09/2020	13/09/2020

- **Paste your answer into the document named T05C.DOCX**

Credit 5f

- Consider a department store transactions:

Product

ProdID	Brand	Description	PricePerOne	QtyInStock
G43546	Gucci	Leather mid-heel pump	1050.00	12

Action

ActionID	ActionDateTime	Action	ProdID	ProdQty	ProdCost
1008	21/01/2021	Purchase	G43546	2	2100.00
1026	23/01/2021	Return	G43546	-1	1050.00

- Write the set of SQL statements to complete each of the transactions in the Action table and update Product table. Make sure you consult lecture slides and lecture recording explaining Transactions concepts.
- Explain when the sale or refund operation can go smoothly or go wrong. Explain the terms “transaction committed” and “transaction roll-back” in the context of your discussion.

References

SQL and ERDs

- Chapter 4 http://proquest.safaribooksonline.com/book/databases/sql/9780321584069 via Swinburne library
- http://www.w3schools.com/sql/
- https://www.techonthenet.com/sql/
- Lecture 9 of this unit