

CITS1402 RDBMS Assignment Project Description

Semester 2, 2018

Business Scenario

There is a client who runs an online restaurant where customers can order their dinner online and have it delivered. Customers are uniquely identified by their mobile phone numbers, they also have names (first, last), addresses and account info such as method of payment (credit card, cheque, or cash). To keep it simple, you are **NOT** required to consider walk in customers.

When ordering dinner, customers may choose multiple dishes together in one order with a specific ordering time. The restaurant sells pizza and allows customers to choose the ingredients (toppings). Customers pick ingredients for their pizzas and sometimes will require different quantities such as a double portion (i.e. quantity is 2) of specific ingredients. Pizzas have various sizes (small, medium, large), ingredients (pepperoni, sausage, mushrooms, onions, extra cheese, etc.), price information, discount prices, thin or thick crust, etc. The other items available (e.g., drinks or chips) have product codes, descriptions, manufacturers, suppliers and prices. To keep it simple, **ONLY** pizzas have ingredients. When ordering dinner, one customer may order multiple pizzas and/or drinks/chips together.

Each order is associated with a particular customer and is handled by a cook and a driver. The cook and the driver are both employees of the restaurant. An employee may be a cook or a driver or have both roles. Each employee has a name, address, phone number and base salary. Assume that they are paid their base salary in addition to being paid for the amount of work that they do, i.e., number of pizzas and deliveries made. An employee earns 50c for each pizza that they make and \$2 for each order they deliver.

The above address should be organised by street number, street name and suburb, e.g., 43 Stirling Highway, Crawley. Each item or ingredient has a cost and retail price, which can be used to calculate the profit.

Tasks

Imagine that you have been assigned to develop a delivery database system for the restaurant based on the above scenario. To develop this database, you need to have the skills and knowledge about relational database concepts, ER diagram modelling, database design theory, and MySQL queries. This assignment is worth **20%** of the total assessment for the unit CITS1402 and consists of three main components:

1. Design and draw an **ER model** for the pizza delivery database [6 marks in total].
 - a. You need to clearly identify essential **entities**, their attributes, and primary keys. (2 marks)
 - b. You need to clearly identify all **relationships**, including IS_A and any other relationships. You also need to specify the cardinality and

minimum cardinality for each relation. If you make any assumptions that are not a part of the business scenario, state them clearly and briefly justify them. (3 marks)

- c. Please provide a short **paragraph** (500 words approx.) to explain the entities, attributes, and relations that you have taken in to consideration and any non-trivial decisions you have made in your design, i.e. why you believe that the entities and their attributes and relationships that you have chosen are important to the business. (1 marks)

Hint: You should present your understanding of the business in Task 1.c, i.e. if you have identified an entity/relation, state why you believe such an entity/relation is important to the business and its database, and *vice versa*. Remember, there is no unique/ best answer to a business problem, hence, this is your chance to present your solution to the stakeholders and argue why it is the most appropriate/cost effective solution to the problem. Failure to present your understanding of the business may lead penalties in Task 1.a and 1.b as the stakeholders may not be able to understand your solution.

2. Implement the relational data schemas based on your ER model [6 marks in total].

- a. Provide the database **schemas** based on your ER Model. To complete this task, you need to identify functional dependencies and ensure that all tables are normalised to at least 3NF. Provide **descriptions** of the **decomposition process** that is applied to any table/entities in your ERD. (3 marks)
- b. Identify **data types** for each attribute in your tables. You need to firstly **list** the data types, and then briefly **explain** why you choose that particular data type. (1 mark)
- c. Please provide all **SQL queries** to create the tables. (1 mark)
- d. Please supply **SQL queries** that insert some dummy records (10 approx.) to each table. You need to refer Task 3 to ensure that you will have valid records returned for each query in Task 3. (1 mark)

Note: You should **NOT** create tables and records using the features provided by MySQL Workbench. That is, you **must provide SQL queries/code** to complete Task 2.c and 2d. **You will NOT receive any mark for 2.c and 2.d if no SQL Query is submitted. You will be penalised if any bug is found in your SQL queries/code, which may also lead further problems in Tasks 3.**

3. **SQL Queries, Procedures and Views [8 marks in total]:**

Provide **SQL queries, procedures and views** to answer the following questions. Please ensure that you have inserted sufficient data in Task 2.d. That is, you need to have at least one record returned by your query for each of the following questions. Otherwise, a penalty will be applied.

- a. List all the employee information of employees who have the roles of both cook and driver in the restaurant. (1 mark)
- b. List the total revenue of this restaurant in different suburbs in descending order. Tip: you can identify the suburb information by using customers' addresses. (1 mark)
- c. Create a procedure SuburbBestCustomer() to list the best customer for each suburb. The best customer is the customer who spent the largest amount in the restaurant. The list should be sorted in descending order. (2 mark)
- d. List the pizza ingredients that **no** customers have chosen before. (1 mark)
- e. Create a view EmployeeSalary() to list all the employees and their total income. Note: the total income consists of base salary and the actual workload as depicted in the above description. (2 mark)
- f. List the top 10 most profitable ingredients in the restaurant in terms of the number of pizzas sold. (1 mark)

Submission Requirements

This is an individual assignment. You need to complete all the tasks on your own and must not copy the work of other students. You need to submit two files: a PDF file named after your student ID (e.g. **21224999.pdf**), and a SQL Query file also named after your student ID (e.g. **21224999.sql**) **via** the link in **Blackboard** by the **Due Date**.

Submission Format

Please read the required submission format carefully. Penalties may be applied for incorrect submission formats.

The PDF file should contain all your design work for Task 1, Task 2.a and 2.b. Your solution for each task should be clearly identified by the Task ID with the comment command '#'. For example:

#Task 1.a Solution:

Your solution goes here

The SQL file should contain all the queries for Task 2.c, Task 2.d and Task 3. You need to write comments for each question and answer. You must use the '#' command in your code to make comments, which will not be executed by the SQL Server. For example:

```
# Query for Task 2.c - creating tables
```

```
# create CUSTOMER table
```

```
CREATE CUSTOMER
```

```
...
```

```
#Query for Task 2.d - inserting records
```

```
#insert 15 records for table CUSTOMER
```

```
INSERT
```

...

It is your responsibility to ensure that your SQL queries are bug free. To do so, carefully test all your queries using MySQL Workbench. Please also save and backup your work regularly to avoid any unexpected loss of your work.

Submission Due Date:

21st October 2018 Sunday 23:59pm. No late submissions will be accepted.