ICT211
Database Design

Task 2

Semester 1, 2021

Assessment and Submission Details

Marks: 30 % of the Total Assessment for the Course

Due Date: Week 11, Friday 5 pm AEST

Assignments are to be submitted by SafeAssign.

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

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

A **<u>draft</u> submission area** will be provided for you to check your assignment for academic integrity purposes. Instructions to use the draft submission link and how to read the draft SafeAssign report are in the Task 2 assessment area. After you have made any final edits **you will still need to submit the final assignment (via the Task 2 Submission folder) by the due date set for it.**

The assignment will be marked out of a total of 100 marks and forms 30% 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: Growing Sunshine Organics

Background

Freya Jones grew up on the Sunshine Coast in south east Queensland on her family's Avocado farm. On completion of her Business degree, Freya realised that her business management knowledge could be applied within the Queensland horticultural industry. Queensland horticulture is worth almost $3 billion per year and is Queensland's second largest primary industry. Freya's passion for the land led her back to the Sunshine Coast hinterland where she invested in an organic fruit and vegetable farm and started trading as Sunshine Organics.

Initially, Freya's business plan was directed at farm fresh organics for the home delivery market but subsequently expanded to cater to the needs of the local restaurant market. There was increasingly high demand for organic fruit and vegetables, so Freya sourced other local producers and started to market their produce alongside her own. Sunshine Organics ensured that their producers were paid well for their products and as a result, they have a waiting list of organic fruit and vegetable farmers who would like to become suppliers.

The organisation had been growing well at around 7% per year. However, during the Covid 19 pandemic in 2020, sales to the local restaurant market slowed, so Freya Jones increased advertising through social media to extend the home delivery market and started to consider how she could diversify. One of her ideas was to build a small number of cabins on her property. The cabins could then be used for accommodation and weekend workshops at which people could learn about growing their own organic produce. To trial the idea Freya invested in three cabins, two one-bedroom cabins and one two-bedroom cabin.

During the autumn and winter of 2020, the demand for Sunshine Organics products to the home delivery market increased dramatically. This was particularly evident while lockdown restrictions were being enforced. As a result, Freya took the opportunity to leave flyers advertising her cabins in every box of produce that was delivered. The response was outstanding. With people unable to travel initially outside Queensland and to date outside Australia, opportunities to take short breaks whilst learning new skills in a new environment have been quickly taken up. From the moment Freya opened her new venture, her weekend workshops have been fully booked with people attending from various parts of south east Queensland. The cabins have been equally popular with workshop attendees travelling from further afield.

The success of the venture together with the growing interest in supporting local business and reducing food miles, resulted in a surge in publicity for Sunshine Organics as being a small business pandemic survival success story. The publicity brought enquiries from farmers in Sunshine Organics' supply network and from other parts of Australia. As a result, Freya started speaking to manufacturers of various styles of kit-set cabins across Australia and has started a community of farmers and growers called Growing Sunshine Organics (GSO). Freya's plan is to on-sell the kit-set cabins, which will be called Sunshine Cabins, that she has negotiated reduced rates for, to the membership of GSO. She also plans to provide a portal for the general public to make bookings with the GSO member/s of their choice.

To date Freya has relied on spreadsheets to keep track of her produce, expenditure, orders and invoices. However, she is aware that this is no longer practical. She has enlisted a local web developer (Zane) to build a website and has asked you, a database design consultant, to make recommendations for the management of the data relating to the new venture.

Based on your analysis, your recommendation is to create a basic Customer Relationship Management style database which could be adapted for future enhancements and additional functionality. As an experienced database designer, you are fully aware that the functionality that Freya would like, will not be possible to achieve in the first phase of the project. You explain the need to define a core database system which will provide a foundation for added functionality in the future.

User Requirements

A joint agreement was formed to design and implement the following core system requirements as the first phase of the GSO database project:

- It has been agreed that the core database entities are likely to be the members of GSO, cabins, workshops and workshop attendees. However, you also know that this may change as there will be other regular and composite entities, and business rules which will determine the entity relationships.

- GSO members will have a unique member id, a member name, a contact name, a date when they joined the group and an end date (should they leave the group – it will be left blank by default), the name of their business, its address, phone number, and email address and a member description where they can describe themselves and their specialty.

- Workshops will have a unique workshop id. Their duration and cost together with a description, the number of available places and whether they are run weekly, fortnightly or monthly will also be recorded.

- A workshop attendee will be known as a customer. They will choose and book a workshop on the website. At the time of booking they must provide their name, email address, home address including State and postcode and a phone number. They must also nominate their chosen workshop and the date of the workshop. The database must also allocate a customer id and the date the workshop booking was made. Further details, such as payment for the booking, will be dealt with directly between the GSO member and the customer.

- Each GSO member may purchase one or more types of cabin. Each cabin type has a name, a square metre measurement and a description. The purchase date and delivery date for each cabin is to be recorded.

- Customers may attend many weekend workshops run by different GSO members. GSO members may run many workshops which multiple customers may attend.

- When a customer books a workshop through the website, the workshop booking is saved into the database and an alert message is automatically sent to the GSO member through a messaging system. The messaging system must be efficient. The message entity will have a unique message id, the customer id and the GSO member id. The message entity will also include a date stamp field and a message field. This simple format will provide the flexibility for its use in many different ways on the website.

Important requirements

You MUST:

- Incorporate MySQL database and its corresponding SQL and procedural language,
- Sequence your script so that it can be run (and re-run) as one sequential script without error

Required data

IMPORTANT NOTE – the following **data MUST be used in your Part B SQL implementation**. A ZERO (0) mark will be awarded for Part B and Part C if the following data is not used as part of your SQL implementation.

Table 1: Cabin Type

Cabin type	Max Occupancy	Size (m^2)	Price ($)	Unit shipping cost ($)
Sunshine Cabin Ace	2	12	9950	400
Sunshine Cabin Beta	2	15	11250	450
Sunshine Cabin Gamma	3	21	12550	500
Sunshine Cabin Delta	4	25	15950	550
Sunshine Cabin Epsilon	4	30	19950	600
Sunshine Cabin Zeta	4	36	24550	650

Table 2: Workshop Details

GSO member	Duration	Repetition	Cost ($)
Rosemary Black	2 day	Monthly	450
Rosemary Black	1 day	Weekly	250
Provide your name here	2 day	Monthly	500
Provide your name here	4 hours	Fortnightly	150
Trent Myrtle	1 day	Monthly	250
Trent Myrtle	4 hour	Weekly	150

Assignment Requirements and Deliverables

Part A

The first part of this assignment requires you to analyse the database requirements and design the first phase of the database project in accordance with the case study background and requirements. Your report should be submitted as a MS Word Document (**not PDF**) in standard professional report format however it does not require the inclusion of an Executive Summary, Introduction or Conclusion. This is not a research report, and thus references are not required.

The following documentation is required:

- Entity Relationship Diagram in Crows Foot Notation (please use app.diagrams.net/ or similar software).
- Relational Schema – including all relationships and appropriate key notation (please use app.diagrams.net/ or similar software).
- Supplementary Design Requirements formatted as a data dictionary. The following information can be used as a guide for the elements to be included:
    - Table names and their data attributes and descriptions;
    - Information on data type, length, format, acceptable values;
    - The compulsory/optional nature of the attribute and if null values are valid.
- Assumptions
- Copies of SQL scripts and output to address the requirements in **Part C** (copied from MySQL, do not embed links to .sql files):
    - SQL queries/scripts in the SQL Query Panel;
    - A summary of the executed MySQL statements including errors and general status information displayed in the Action Output Panel; and
    - The Results Grid or SQL View Panel showing the output results from executed MySQL statements.

Regardless of the drawing software you use, each of your drawings must be saved as an image (e.g. png) and then pasted into your Word document. **Do not embed the link to your drawing as this will not be marked and you will receive zero marks for your models.**

Part B

You are required to implement a MySQL database using the database design developed in Part A.

The MySQL database must be submitted as a single plain text file with name <studentNumber>_crm.sql, it should contain all your SQL implementation.

IMPORTANT NOTES:

- Your Parts B and C MUST work on a MySQL database and be able to be demonstrated to Zane so he is able to apply your SQL implementation into the new website.
- Where you are asked to **incorporate the exact data provided** there will be a Zero (0) mark awarded if different data is incorporated.

The following requirements are to be implemented:

- CREATE TABLE statements for all tables including integrity constraints

- CREATE TRIGGER statement to automatically insert a message to the Message table when a customer order is placed

- INSERT INTO statements for populating the database:
    - Incorporate the exact 6 cabin types and the details given in Table 1 (make up information not supplied)
    - Incorporate the exact 6 workshop details given in Table 2 (make up information not supplied)
    - Incorporate the exact 3 GSO members whose names appear in Table 2 (make up information not supplied)
    - Create at least 6 customers, incorporate your tutor's name into the customer data
    - Create workshop bookings for at least 6 customers
    - Make sure that at least 3 customers make multiple bookings
    - Data may need to be inserted in a particular order to comply with integrity constraints

Part C

The following requirements are to be implemented:

- SELECT statement/s that will produce the following data for a sample of workshop bookings. The report should only include the data as described below. (You will need to have the data in the database for this query.):
    - The workshop booking report will include:
        - List of all bookings made between a start date and an end date
        - GSO member name and account number
        - Workshop id, date and the cost
        - Customer name, phone and email
        - The report will be grouped by GSO member and will be ordered in consecutive date order.
- SELECT statement that will provide the following data for the customer with your tutor's name. The customer must have made multiple workshop bookings. The report should only include the data as described below. (You will need to have the data in the database for this query.):
    - Customer name and id
    - Booking date
    - Member id and business name
    - Workshop id, location, date and cost
    - Total cost of all workshops booked by the customer
    - Average cost of workshops booked

Submission

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 (please see the marking rubric at the end of this document). Late submission of the assignment will result in a percentage deduction of marks in accordance with the submission penalties stated in section 10.3 of the course outline. (This includes weekends.)

Assignment Return and Release of Grades

Assignment grades will be available on the course web site. 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 the assignment will be withheld until the investigation has concluded.

ICT211 Task 2 – Database Design Report Rubric

Criteria	High Distinction (85-100%)	Distinction (75-84%)	Credit (65-74%)	Pass (50-64%)	Fail
(10%) 1. Demonstrate an understanding of client requirements.	**Comprehensive and insightful** Insightful and comprehensive reflection of client specifications in the overall analysis, design and implementation of the database.	**Thorough** Comprehensive reflection of client specifications in the overall analysis, design and implementation of the database.	**Effective** Effective reflection of client specifications in the overall analysis, design and implementation of the database.	**Accurate** Accurate reflection of client specifications in the overall analysis, design and implementation of the database.	**Narrow / shallow** Narrow/shallow reflection of client specifications in the overall analysis, design and implementation of the database.
(25%) 2. Create relational database design schema and documentation.	**Systematic and skillful** Accurate, clear and skillful creation of ER diagrams and relational schema. Systematic, clear and accurate supplementary design requirements and assumptions.	**Thorough and effective** Accurate creation of ER diagrams and relational schema. Thorough and effective supplementary design requirements and assumptions.	**Effective** Effective creation of ER diagrams and relational schema. Useful supplementary design requirements and appropriate assumptions.	**Competent** Good creation of ER diagrams and relational schema, supplementary design requirements and assumptions.	**Basic / simplistic** Basic / simplistic creation of ER diagrams and relational schema, supplementary design requirements and assumptions.
(10%) 3. Create a cohesive database design that is reflected in the prototype code.	**Comprehensive** ER diagrams, relational schema, supplementary design requirements are comprehensively reflected in the prototype code. Assumptions and business rules are meticulously reflected in the database constraints.	**Thorough** ER diagrams, relational schema, supplementary design requirements are thoroughly reflected in the prototype code. Assumptions and business rules are well reflected in the database constraints.	**Effective** ER diagrams, relational schema, supplementary design requirements are soundly reflected in the prototype code. Assumptions and business rules are mostly reflected in the database constraints.	**Accurate** ER diagrams, relational schema, supplementary design requirements and assumptions are generally reflected in the prototype code.	**Narrow / shallow** ER diagrams, relational schema, supplementary design requirements and assumptions are narrowly / not reflected in the prototype code. Some assumptions and business rules reflected in the database constraints.

Criteria	High Distinction (85-100%)	Distinction (75-84%)	Credit (65-74%)	Pass (50-64%)	Fail
(15%) 4. Create SQL code to create and delete relational database tables.	**Skillful and seamless** The SQL script will be skilfully constructed and seamlessly drop and create MySQL tables along with comprehensive constraints without error.	**Proficient** The SQL script will proficiently drop and create MySQL tables along with sound constraints without error.	**Effective** The SQL script will effectively drop and create MySQL tables along with effective constraints with only minor errors.	**Competent** The basic but sound SQL script will drop and create MySQL tables along with basic constraints with only minor errors.	**Limited / inaccurate** The SQL script has substantial errors / inadequate code when dropping and creating MySQL tables.
(30%) 5. Create SQL code to insert, search and manipulate the relational database data.	**Skillful and seamless** The SQL script will be skillfully constructed and seamlessly insert, search and manipulate MySQL database data without error.	**Proficient** The SQL script will efficiently insert, search and manipulate MySQL database data without error.	**Effective** The SQL script will effectively insert, search and manipulate MySQL database data with only minor errors.	**Competent** The basic SQL script will insert, search and manipulate MySQL database data with only minor errors.	**Limited / inaccurate** Incorrect data used (Zero mark) The SQL script has substantial errors / inadequate code when inserting, searching and manipulating MySQL database data.
(10%) 6. Create SQL code to demonstrate the use and understanding of procedural language in relational databases.	**Skillful and seamless** The SQL script is skillfully constructed and seamlessly demonstrates appropriate and correct MySQL triggers without error.	**Proficient** The SQL script proficiently demonstrates appropriate and correct MySQL triggers without error.	**Effective** The SQL script effectively demonstrates appropriate and correct MySQL triggers with only minor errors.	**Competent** The basic SQL script demonstrates MySQL triggers with only minor errors.	**Limited / inaccurate** The SQL script has substantial errors / inadequate code when demonstrating MySQL triggers.