**Module Learning Outcomes:**

* Apply redundancy control in designing a database.
* Demonstrate a database solution using an appropriate tool based on a case study.

**Case Study:**

**APU Café Food Ordering System**

Asia Pacific University (APU) café offers a wide range of dishes and drinks for their clients. The café serves students and staff. The café decided to enhance their business by having a database system to handle information about their customers and food orders. Your team is assigned to design and implement a database system for Online APU Café Food Ordering System.

**Scenario:**

* APU students and staff who wish to order food online are required to register as a member. Member can view the food menu, read reviews, and do comparison of food menu.
* Members who wish to order meals can add selected food items into the system shopping cart. The shopping cart should show a summary of the order and total cost to be paid (Check out). The order is complete once the payment is made.
* The cafe manager compiles a list of meal orders and sends cooking requests to the chef.
* The chef cooks the meals one by one in the order sequence they received from the manager and sends the cooked meal to the cafe.
* The cafe manager records the details of the meal orders and cooked meal that he receives from the chef.
* Finally, the dispatch workers send the cooked meal to the member within 15 minutes.
* Members can also rate food on a scale of 1-5 (1= poor, 5= excellent). Only one feedback per member, per food is allowed.
* The system should provide information about the food menu in the cafe, members, food they have ordered as well as payment details and delivery status.
* The café has 1 manager, 3 chefs and 3 dispatch workers.

Food order – many to many

Cart – one to many

\*Note: you may make any other logical assumptions which makes the system complete

**Coursework Details:**

1. In this assignment, you are required to design, implement, and document a database system for APU Café Food Ordering System.

## Create the following queries using Data Manipulation Language (DML) – student must be able to explain the queries.

* 1. List the food(s) which has the highest rating. Show food id, food name and the rating.
  2. Find the total number of feedback per member. Show member id, member name and total number of feedback per member.
  3. Find the total number of food(meal) ordered by manager from each chef.
  4. Find the total number of food(meal) cooked by each chef. Show chef id, chef name, and number of meals cooked.
  5. List all the food where its average rating is more than the average rating of all food.
  6. Find the top 3 bestselling food(s). The list should include id, name, price and quantity sold.
  7. Show the top 3 members who spent most on ordering food. List should include id and name and whether they student or staff,
  8. Show the total members based on gender who are registered as members. List should include id, name, role(student/staff) and gender.
  9. Show a list of ordered food which has not been delivered to members. The list should show member id, role(student/staff), contact number, food id, food name, quantity, date, and status of delivery.
  10. Show a list of members who made more than 2 orders. The list should show their member id, name, and role(student/staff) and total orders.

## Deliverables - Minimum requirement of your documentation:

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| **Part** | **Component** |
| **1** | 1. Database and Database Management System  * Discuss the disadvantages of file-based system, relate your discussion to the case study * Discuss the advantages of Database and DBMS, functions of DBMS, relate your discussion to the case study |
| **1** | 1. Business Rules & Normalization  * Provide a list of business rules (approximately 10-15 rules) * Provide an example of UNF according to case study, then perform normalization up to 3NF clearly showing all the steps with explanation |
| **1** | 1. Entity Relationship Diagram  * Design the database using Chen’s or Crow’s foot notation. Draw the ERD with any suitable tools such as Visio. All entities, attributes, relationship, and constraints should be shown. |
| **2** | 1. Database Schema  * Re-submit the Entity Relationship Diagram, you may make changes to the ERD submitted in Part 1 * Generate the database diagram from the DBMS |
| **2** | 1. SQL-Data Definition Language (DDL)  * Write SQL statements to create all tables with suitable data types * Write SQL statements to populate around 5-10 rows of data into each table * Screen shot all tables with its data * Screen shot all query statements |
| **2** | 1. SQL-Data Manipulation Language (DML)  * Write SQL statements to answer question (2) above * Screen shot all query statements together with its executed result |

**General Requirements:**

In this assignment you are required to:

* Work in a group of 3-4 members.
* Design and implement a solution to a business problem.
* Implement the solution using any Enterprise DBMS.
* Document the solution as set out in the assignment requirements.
* Each group member is required to participate in all tasks / discussions together.
* Submit the assignment through Moodle before/on due date and time given by module lecturer.
* **Presentation schedules shall be released by module lecturer.**

## Note: It is acceptable for discrete activities of this assignment to be undertaken by individual group members. However, it is essential that all group members understand the presentation in its entirety. At the end of the presentation your group will be asked a series of questions to explore your understanding and analysis of the given problem. Responses to these questions such as “I don’t know because I didn't work on that part of the assignment” are not acceptable and will result in a penalty.

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| **Part** | **Assessment Criteria:** | **Marks Allocation** | **Submission Date** |
| **1** | **Group Component (40%)**   1. Database and Database Management System 2. Business Rules & Normalization 3. Entity Relationship Diagram | 8%  12%  20% | **8 Feb 11.59pm** |
| **2** | **Group Component (60%)**   1. Database Schema 2. SQL-Data Definition Language (DDL) 3. SQL-Data Manipulation Language (DML) | 18%  12%  30% | **3 March 11.59pm** |