Database Design 5915 and Database Design
Assignment 2
This assignment is worth 150 marks which constitutes 25% of the total marks for this unit.

Due dates:

- Present draft database during Tutorial Week 11
- Present the final database during Lecture 1 Week 12
- Submit final documents and Database Tuesday Week 12

Please contact your unit convener if you have any questions about this assignment.

1. General Information

The purpose of this assignment is to provide you with experience in **analysing**, **designing**, and **implementing** a solution for the scenario given below. Your solution should be implemented as a database application using Oracle APEX. This assignment will help you to understand the nature and purpose of **database analysis**, **design**, and **implementation**. It offers you experience in **managing a technical database project**. You will also enhance your skills in **conceptual**, **logical design,** and **database documentation**.

This assignment is to be attempted by groups of 4 to 5 students. Each group is collectively responsible for both the submission and the outcome. *Individual efforts will not be marked.* There are no restrictions on the use of word processors or similar tools to produce submissions for this assignment.

Be sure to maintain regular back-ups for any models or material prepared with the aid of software. Loss of files will not be accepted as an excuse for non-completion of this assignment. Submit your assignment to the Canvas website of this subject. Marked assignments will be available from the Canvas website of this subject.

2. Problem Description

The XYZ gym's system stores the staff information: staff number, name (first and last name), home address, home phone number, date of birth (DOB), gender, date joined the gym, job title, salary, and branch number. Each branch has a unique branch number, address, and up to four phone numbers. Each branch has the following staff members: one Manager, several Instructors, and administrative staff. The Manager must be a senior instructor and is assigned to manage one gym branch.

New gym members must first register at a branch by completing an application form, which records their details: first name, last name, date of birth, street, postcode, and phone number. The system also gives each member a unique member ID.

When a new member joins the gym, the system issues and prints them a membership card with a unique number, the card allows the gym members to enter the gym. The database system must store the card information as follows: the member's photo, the card number, the member's ID, card printing date, card status(active/inactive), and reason for printing (new/replacement card). A member can request printing a new card in case their card is lost or stolen. The new card will have a new card number to deactivate the old one.

Before using the gym, a member is requested to be assessed by one of the instructors. The assessment session (preliminary session), which is identified by a unique ID is held on a specific date and time and may include one or more new members. The assessment session records the following measurements for each member:

1- Measure areas like the waist, hips, shoulders, and arms.
2- Weight and height.
3- Body fat percentage.
4- Fitness level.

The assessment also records the member goal(s) of training (weight loss, fat loss, muscle gain, increase fitness, etc.). A member may have one or more goals.

A member is free to select any of the following services:

1- Using the gym facilities.
2- Group exercises (i.e. Cycling, Yoga, Boxing, Kickboxing, etc..
3- Hire a personal trainer (i.e. one of the gym instructors).
4- Request a nutrition monitoring program.

The services selected by a member determine the fees a member must pay. Each service has a certain cost per day. The fees apply from the date a member decides to select a service and stop from the date a member decides to cancel them. A member has the option to select and cancel any service as many times as they want.

After each month, the instructor records the progress made by the member and notes the same above measurements in a separate session (follow-up session) with a unique session ID and specific date and time for one or more members.

The database system manages the finances of the gym, it issues and emails invoices to the members. Each invoice is identified by a unique number, it has a date and a total amount, and it is issued for a specific member by a staff member. The invoice contains the following details:

1- The type of service
2- Cost per day
3- Number of days
4- Total amount of the service (Cost per day multiplied by number of days).

In addition to that, the database system stores the payments received from the members. The payment information is: payment ID, date, amount, the staff who received the payment, and payment method (cash, credit card, cheque). An invoice can be paid in one or more payments.

3. Requirements

You are required to design and implement a database system using Oracle APEX. XYZ database developed by your team should have well-designed screens that are easy to use by XYZ staff and members. **You are required to enter enough records in each table of your database to demonstrate all the functionalities of your database.**

For security reasons, **authentication and authorization scheme** must be implemented to show different **features and data according to the users (see below).** The implemented database system application must have the facilities/functionalities listed below:

1. **XYZ staff should be able to use the XYZ database system to:**
   - Display the details of all members per branch (Master-Detail).
   - Display a list of members per service (Master-Detail).
   - Print a member card.
   - Enter the details of a new member.
   - Enter the details of a payment/invoice (Master-Detail).
   - Display a Dashboard with a **Bar chart** that shows the count of members per service and a **Pie chart** that shows the count of paid vs unpaid invoices.
   - List payments made by a member (Master-Detail).
   - List payments made by a given attendee (Master-Detail).
   - List all unpaid invoices.
   - List members who printed their cards three times or more.
   - List the member ID of a member with maximum participation in a specific service.
   - List all partially paid invoices.

2. **The members should be able to use the XYZ database system to** (attendees are allowed to see their data only):
   - Enter their details.
   - Request new card.
   - Update their details.
   - Select a new service.
   - Display assessment session details (Master-Detail).
   - View their invoices.
   - Make a payment.

Remarks:

1. Naming conventions and the use of different colours would enhance your design. You are encouraged to consider such features, but only after you have achieved the basic design.

2. The basic concepts like tables, queries, forms, reports, etc were covered during various laboratory exercises of this term.

SUBMISSIONS

For the scenario above, please state any relevant and reasonable assumptions and include them in the database documentation, submit the items listed below on the Canvas site by the due date.

A. Your design documents:

- The Conceptual ERD **in a PDF file** (Entities' names and primary keys); and
- Logical ERD **in a PDF file** (Entities' names, primary keys, and foreign keys) derived from the Conceptual ERD; and
- The Relational Model **in a word file** (Tables' names, primary keys, foreign keys, and other attributes) derived from the Logical ERD; and
- The final Data Dictionaries **in a Word file** (description of entities, description of relationships, and description of attributes. **See slides 17,19, and 20 from Week 4 Lec01B** notes).

B. Your APEX database.

C. The database documentation **in a Word file**; and

D. The group members' list showing the name of each member and which part they contributed to **in a Word file**.

This is a total of seven files. **One submission is required by each group**.

MARKING

Assignment Presentation	10
CONCEPTUAL ERD	20

LOGICAL ERD (mapped from the conceptual ERD)		20
Data Dictionaries		20
Database documentation (see below) *		15
Tables		20
Data (see below) **		15
Forms		15
Reports		15
	TOTAL	**150**

* **Database documentation includes**:

1. Introduction.
2. Instructions on how to operate the application (User manual).
3. Screen shots of your forms and reports, underneath each form and report you must show the table(s) and/or view(s) used to create that form/report.
4. Future directions.

Presentation and style should be paid attention to.

**Data must be enough to demonstrate proper testing for the implemented database system.

Note: Please remember that late submission, unless authorised by the unit convener, may not be accepted.