Introduction

The aim of this course is to learn about databases and interfaces. The lectures and the labs are designed to support your technical skills to achieve this goal. The grades are distributed as following:

1. 50% Final exam
2. 50% Course work

Submission: **24ᵗʰ April 2023 23:59:00**

Section A: System requirements

You will have to build a web front-end to the database using HTML, CSS and Javascript that will connect to your database and execute queries using PHP and SQL.

This project requires your group to develop a Car Rental Reservation System for a premier car rental agency. The system must require the staff to enter their assigned username and password before using the system. Upon login, the system should display the user's actual name on the system's user interface. The system must have the following functionalities:

a.   **New Reservation**
Staff can check the availability of the car and make a reservation for a particular date. Upon successful reservation, the reservation number is provided to the customer. This reservation number is required for changes to an existing reservation and to validate the customer's identity when they pick up their rental vehicle. There are three types of premier cars as described below:

  i.   **Luxurious Car**
Rolls Royce Phantom (Blue) – RM 9800 per day
Bentley Continental Flying Spur (White) - RM 4800 per day
Mercedes Benz CLS 350 (Silver) - RM 1350 per day
Jaguar S Type (Champagne) - RM 1350 per day

  ii.   **Sports Car**
Ferrari F430 Scuderia (Red) - RM 6000 per day
Lamborghini Murcielago LP640 (Matte Black) - RM 7000 per day
Porsche Boxster (White) - RM 2800 per day
Lexus SC430 (Black) - RM 1600 per day

  iii.   **Classics Car**
Jaguar MK 2 (White) - RM 2200 per day
Rolls Royce Silver Spirit Limousine (Georgian Silver) - RM 3200 per day
MG TD (Red) - RM 2500 per day

b. **Change / Update Reservation**

Customers may modify their reservation if they would like to book a different date. The system then has to verify that the unit is available before making any changes to the reservation.

c. **Cancel Reservation**

A customer may cancel the reservation for a reserved car rental. The customer must provide the reservation ID so that staff members can retrieve the reservation information in the system.

To successfully complete this project, you must follow a series of steps. Firstly, you need to study the system requirements thoroughly to understand the needs of the project. Then, based on the information you gather, you must design a database schema that includes tables, links, primary keys, foreign keys, and relations. After completing the design, you should proceed with implementing the database schema in MySQL. As a next step, you are required to create an Entity Relational Diagram (ERD) to help visualize the database implementation. Once you have completed these steps, you must design a sketch for the interface that will be used to connect to the database. Following the design, you will implement the interface using various technologies like HTML, CSS, JS, PHP, and NodeJS. It is vital to test the system thoroughly to ensure that it is functioning correctly. Finally, you must create a video explaining how your application works.

Section B: Deliverables

This section describes which files need to be submitted for assignment and how they should be organised. Remember, there are many students in the class, thus the organisation of your submission is very important.

ER diagram

In this project, each group is required to submit an ER diagram called **ERD.pdf** detailing the database design. By providing this information, the group can demonstrate their understanding of the database and their ability to design a database that meets the requirements of the project while addressing any issues that may arise. You should follow the format shown in the ER diagram example below.
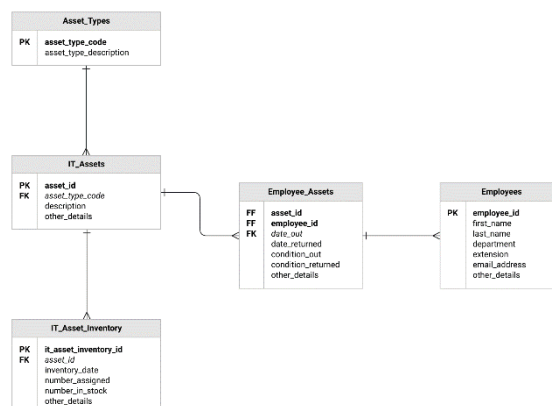
Database

In order to implement the ER diagram in the COMP1044 coursework, the group must create tables based on the design. This can be achieved using SQL commands to define the columns and constraints for each table. Once the tables are created, the group can then insert the data values into each table using SQL INSERT statements. To ensure that the entire database can be easily shared and reviewed, the group must export the database to an SQL format. The exported file should be named **COMP1044_database.sql**.

Program implementation

To submit the program source code for the COMP1044 coursework, the group must create a zip file that contains the entire local project folder. The zip file should be named **COMP1044_SRC.zip**. The zip file should contain all the necessary files required to run the program, including the source code, images, and any other relevant files.

Video demonstration

The video should not exceed 5 minutes in length and should be saved in either MPEG or MP4 format. The video demo will be the primary way in which the instructor assesses whether the software is working correctly. Therefore, it is essential to ensure that the video is clear, concise, and demonstrates all the system functions. The demo video should include all interactions with the database, including select, insert, delete, and update functions. The video should explain each system function clearly and demonstrate how it interacts with the database.

Folder and File Organisation

In the COMP1044 coursework, the maximum file size for uploads on Moodle is limited to 250MB. To ensure that the coursework submission is within the size limit, the group must create a zip archive. The zip archive should be named according to the given format "**COMP1044_CW_Gx.zip**", where x is the group number. For instance, if the group number is 12, the zip file should be named "**COMP1044_CW_G12.zip**." Once the folder is zipped, the resulting archive can be uploaded to Moodle.

All of the following documents should be included in a submission zip file:

- **ERD.pdf**, an ER diagram describing the database design.
- Exporting the database to a file with the name **COMP1044_database.sql**.
- **COMP1044_SRC.zip**, zip file containing a folder with all of your source code.
- A video of up to 5 minutes as described above, in .mp4 format.

Deadline: **24th April 2023 23:59:00**

Note: You are gently reminded that we are at liberty to use plagiarism detection software on your submission. Plagiarism will not be tolerated, and academic offences will be dealt with in accordance with university policy and as detailed in the student handbook. This means you may informally discuss the coursework with other students, but your submission must be your own work. If you are unclear about this process, please discuss with the module convenors during one of our lab sessions or at the end of a teaching session.

MARKING CRITERIA/RUBRIC

Assessment Criteria and Marking Overview Tasks	Marks given	Marks awarded
1. ER diagram • Good naming conventions • No redundant or unnecessary entities or relationships • All components are properly labeled	10	
2. Database implementation • Database created correctly • All tables created correctly • All attributes are created correctly • All primary and foreign keys created correctly	30	
3. Demonstration video • Showing system running • Explaining the system functionalities • Timing (5 minutes)	10	
4. Coding and implementation • All the functions run smoothly without errors • Incorporates good programming practices • Clear evidence of appropriate usage of HTML, CSS, JavaScript, PHP and SQL features • Unique solution	50	
Total marks	**100**	
Total	**50%**	