

# Introduction to Database

IT-244

## Database Project

**Due Date: 22-Dec-2016**

### I. Instructions:

1. In this file, you will find a list of database project ideas. You must choose one of them to design and implement.
2. You can work on this project as a group (maximum 3 students) or individually. You have to send the names of group members to you your instructor by the end of week 7.
3. This project worth 10 marks, will be distributed as following:
  - a. Design the database, following an ER model. (2 marks)
  - b. Normalize the tables ( each table should be in 3NF at least) (2 marks)
  - c. Use MySQL or any other database to create the normalized tables. (2 marks)
  - d. Populate your tables with 5 rows at least. (2 marks)
  - e. Execute the sample requested queries. (2 marks)
4. Each student has to submit one report about his/her project via the Blackboard contains the following:
  - a. ER Diagram.
  - b. All schemas before and after normalization.
  - c. All SQL statements of :
    - i. creating tables
    - ii. inserting data in tables
    - iii. queries.
  - d. Screenshots from MySQL (or any other software you use) of all the tables after population and queries results.

### II. Project Ideas:

#### Project 1

LSBU Outward Bound

LSBU runs an Outward Bound Centre based in the Lake District wishes to build a database to store and manage information about its business. The Outward Bound Centre takes bookings from clients for adventure holidays and team building events.

Clients are organisations such as schools, youth groups and businesses. Information stored about clients includes their unique client number, the client's name (School name, business name, etc.), and the name and contact details of the person representing the client organisation.

The centre has a number of accommodation options: a four star hotel; a hostel with large dormitories for children and smaller shared rooms for supervising adults; and a small camping ground. The name and type of these options is stored, along with the total number of people they can accommodate.

Each booking has a unique booking number, the date that booking was made, and the dates of the stay. When making a booking, clients state how many people will be staying, and what type of accommodation is required. They also say whether they will use the restaurant or self-catering facilities. The booking will also include any additional facilities required by the client.

The centre contains a number of additional facilities for hire. These include lecture theatres, teaching rooms and computing labs with Internet access. Portable multi-media projection and presentation equipment are also available for hire.

There are various outdoor pursuits facilities including: obstacle course, climbing-wall with safety equipment, paintball-wargames, canoes, hill walking... etc. Details of these various facilities, including any hire charges, need to be stored on the database. During any booking, the client may use these facilities. The date when a facility is booked for use must be recorded.

Use of outdoor pursuit facilities is supervised by one or more trained members of staff. Staff may be trained to supervise more than one outdoor pursuit facility. Each member of staff has a unique staff number, and their name and contract details (full or part time) are also recorded

### **SQL Queries:**

1. Write a query to find which Customer has made the most bookings in the last 6 last months
2. Write a query to find what is the average age of staff who are assigned to work on the outdoor pursuits
3. Write a query to produce a list of all customers who have rented self-catering accommodation in the past year.

4. Write a stored procedure to calculate a final bill for a given customer who has used various facilities during their stay
5. E) Write a stored procedure to provide a monthly report showing the total revenue raised by each outdoor pursuit

## **Project 2**

### **Library Management System**

This project supposed to develop a database system for a library for a university. The system contains information about books, book authors, students, and faculty. Students and faculty are allowed to borrow books from the library. You should design the system to contain entities and attributes to store data that makes the system able to report the requested information by executing the queries.

#### **SQL Queries:**

1. List the names and email for students who borrowed books along with the number of books they have borrowed.
2. List the names and departments for instructors who have borrowed books.
3. List all the books that are borrowed along with the borrower name and borrowing date.
4. List the names and email for all borrowers who have not returned the books.
5. List all books for a particular author.
6. List all books that belong to “Information Technology” field.

## **Project 3**

### **Online Bookstore**

Consider the following set of requirements for an online bookstore database. Design an ER diagram for this application:

- The online bookstore keeps track of each member’s name, email, password, current address, phone number, and username for for each member. The management team may need to use the information about the member's address for some statistical studies or for sales

promotions. They may need to use City, Zip code, district, street, Neighborhood, apartment number and country. A member may have a list of favorites books.

- Each member can buy book by adding it to the basket, the check out and proceed to the payment method. Member can use Gift Cheque to pay for his/her order, or use credit card, or both.
- A record of the order should identify the order's items, the payment method, gift cheque, the date of the order placement the shipping address, the paid amount.
- Each book has a title, ISBN, author, publisher, price, number of pages, language, category, type (used, new, like new, light used, ebook). The ISBN is unique for each book.
- Basket may contain some book, if so, basket should have a list of picked books and quantities and the total price.
- Payment method should include the following information cardholder name, cardholder surname, card number, card type (visa, master card, etc.), card expiry date, card security code, total price paid after deducting the gift cheque value.
- Ach Gift Cheque must have a Cheque-number, expiry date, and amount.

### **SQL Queries:**

1. Find the name of all members who have placed an order with a total above 500\$
2. Find the zip code of all member who used the gift cheque to pay for their orders.
3. Find the categories of all the books that listed under john's favorite books
4. Find the title, author, and publisher of all books that cost more than 200\$ with page# less than 300 pages.