ASSIGNMENT

3

BIT795 Relational Database Systems

Assignment 3 (TMA3)

Due date

▶ Please refer to the Study plan for the due date.

Weighting

▶ Assignment 3 is worth **35%** of the total course mark.

▶ You will need to achieve **minimum of 40%** to pass this assignment.

Aim

The aim of this assignment is for you to demonstrate your knowledge of database database design using Structured Query Language, and to apply it to some basic situations.

This assignment assesses learning outcomes:

2. Model E-R data using a relational model representation.

4. Apply the functions of Structured Query Language (SQL).

5. Systematically develop, implement, test and document a database solution to suit the information requirements of an enterprise.

Assignment overview

You are required answer questions relating to theoretical and practical aspects of database design. All questions relate to information from Modules 7, 8 and 9. Please ensure you have completed all topics and activities from them before attempting this assignment.

All work submitted must be your own.

Instructions

The deliverables in TMA3 are:

▶ database 'cat' (Colonial Adventure Tours)

▶ formal report in a Word document.

To create a copy of a database for submission, use the Data Export facility in MySQL Workbench. To export your database:

▶ open the Data Export window in MySQL Workbench (click on **Data Export** under the **Management** category in Navigator)

▶ select your database from the list of schemas

▶ make sure that the options **'Dump structure and data'**, **'Dump stored procedures and functions'**, and **'Export to self-contained file'** are selected and then click the **Start export** button.

Your database should be named as: DatabaseName_YourSurname_YourStudentNumber.

The report should include the SQL code that you developed while answering the assessment questions, and screenshots of the results of executing the SQL code.

All questions in this assignment are based on the Colonial Adventure Tours case study.

In TMA 2, you created the entity-relationship data model and logical database design for the Colonial Adventure Tours (CAT) database.

In this assignment, you are asked to create a database that represents the ER data model and logical design for the CAT database in the MySQL relational database management system.
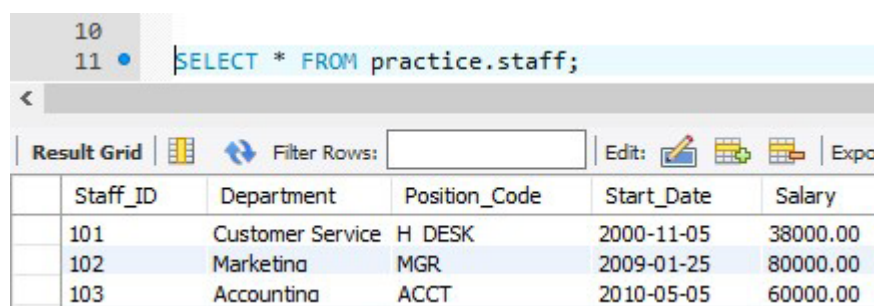
The CAT case study can be found in the downloadable document "Case Study-Colonial Adventure Tours" in the **Assessments** tab.

Before you start

Before you start answering the questions, you have to create the CAT database in your MySQL DBMS. Then you will create the tables and populate them with sample data.

The SQL scripts to create and populate the five tables described in the case study can be found here.

For all questions, you should write and execute the required SQL queries or routines, and show the results of these queries or routines (include the codes and the screenshots of the SQL codes and the results). For example, the screenshot may look similar to the following:

```
10
11 ●    SELECT * FROM practice.staff;
```

Staff_ID	Department	Position_Code	Start_Date	Salary
101	Customer Service	H_DESK	2000-11-05	38000.00
102	Marketing	MGR	2009-01-25	80000.00
103	Accounting	ACCT	2010-05-05	60000.00

Question 1

Write and execute the SQL statements to establish appropriate relationships between the tables, so that the referential integrity is enforced.

(4 marks)

Question 2

Write and execute the SQL statements to create the required unique indexes on candidate keys for at least four tables. Indexes should reinforce entity integrity by avoiding duplicate entries when using surrogate primary keys.

If you amended your design of unique indexes (that you submitted in TMA2), provide a justification for the changes.

(6 marks)

Question 3

Create and run the SQL query that displays the name of each trip that does not start in New Hampshire, has the type Biking and has a distance of greater than 15 miles.

Provide the SQL codes and the screenshot of the result.

(5 marks)

Question 4

Write and execute the SQL statements to find out how many trips have a type of Hiking or Biking and originate in the states Maine (ME) and Massachusetts (MA).

Provide the SQL codes and the screenshot of the result.

(5 marks)

Question 5

Create and run the SQL query that outputs the number of reservations that include a trip with a price greater than $25 but less than $70.

Provide the SQL codes and the screenshot of the result.

(5 marks)

Question 6

Create and run the SQL query that lists the trip name, type, and maximum group size for all trips that have Susan Kiley as a guide.

Provide the SQL codes and the screenshot of the result.

(5 marks)

Question 7

Write and execute the SQL statements to display the trip name and state for each trip that occurs during the Summer season. The results should be sorted by trip name within state.

Provide the SQL codes and the screenshot of the result.

(5 marks)

Question 8

Write and execute the SQL statements to output the name and the season of each trip that has the type Hiking, and that is guided by Rita Boyers.

Provide the SQL codes and the screenshot of the result.

(6 marks)

Question 9

Write and execute the SQL statements to list the trip name, the guide's first name, and the guide's last name for all trips that originate in New Hampshire (NH).

All selected trips should be related to mountain trips, so the trip names should contain the letters 'mount', or 'mountains', or 'mt', or 'mtn'.

Sort the results by guide's last name within trip name.

Provide the SQL codes and the screenshot of the result.

(6 marks)

Question 10

Write and execute the SQL statements to display the reservation ID, customer number, customer last name, and customer first name for all trips that occur in July 2016.

Provide the SQL codes and the screenshot of the result.

(5 marks)

Question 11

Colonial Adventure Tours calculates the total price of a trip by adding the trip price plus other fees and multiplying the result by the number of persons included in the reservation.

Create and run the SQL query that lists the reservation ID, trip name, customer's last name, customer's first name, and total cost for all reservations where the number of persons is greater than four.

Provide the SQL codes and the screenshot of the result.

(6 marks)

Question 12

Write the SQL statements to create and run a view called 'Guides_Paddling' that displays guide's last name, first name for guides who guide the paddling trips that originate in the state NH. The output should be sorted by last name.

Provide the SQL codes and the screenshot of the result.

(6 marks)

Question 13

Write the SQL statements to create and run a view called 'Trips_in_states' that displays the states that have more than three trips originating in these states.

The output should include a list of states in alphabetical order and the number of trips for each state.

Provide the SQL codes and the screenshot of the result.

(6 marks)

Question 14

Write the SQL statements to create and run a stored procedure called 'DisplayGuideName' that takes the guide's number and displays the guide's full name.

Run your procedure using BR01 as the test data, and display the results in the format: 'The guide's full name is Joe Bloggs'.

Provide the SQL codes and the screenshot of the result.

(7 marks)

Question 15

Write the SQL statements to create and run a stored procedure called 'ShowReservationInfo' that takes the reservation ID and displays the corresponding reservation information that includes customer number, customer last name and the number of people.

Run your procedure using reservation ID 1600008 as the test data.

Provide the SQL codes and the screenshot of the result.

(8 marks)

Question 16

Write the SQL statements to create and run a function called AvgDist_TripType_Guide that takes the type of trip and the guide number and displays the average distance of trips for the specified type of trip guided by the specified guide.

The result should be presented in the format:

'The average distance for this combination of the trip type and guide is...'

In the case when the specified combination of the trip type and guide does not exist, the following message should be displayed:

'This combination of the trip type and guide does not exist'.

Run your function using the following three pairs of test data:

▶ Paddling, SL01

▶ Biking, AM01

▶ Hiking, SL01

Provide the SQL codes and the screenshot of the result.

(9 marks)

Question 17

Write the SQL statements to create and run a stored procedure called 'UpdateMaxGrpSize' that takes the trip ID and the maximum size of the group and updates the corresponding value of the maximum group size with the specified data.

Test your procedure by using the following test data:

▶ Trip ID = 12

▶ Maximum group size = 18.

Provide the SQL codes. Display the before and after values of MaxGrpSize to confirm that your code is correct.

(6 marks)

Marking schedule

Your lecturer will use this marking schedule to provide you with a grade. They may also provide qualitative feedback (comments) about your work.

Assessment against criteria		
Criteria	Marks	Score
Question 1		/4
The SQL statements enforcing referential integrity created and executed.	4 marks	
Question 2		/6
The appropriate unique indexes on candidate keys created.	6 marks	
Question 3		/5
The required SQL query created and the correct result produced.	5 marks	
Question 4		/5
The required SQL query created and the correct result produced.	5 marks	
Question 5		/5
The required SQL query created and the correct result produced.	5 marks	
Question 6		/5
The required SQL query created and the correct result produced.	5 marks	
Question 7		/5
The required SQL query created and the correct result produced.	5 marks	
Question 8		/6
The required SQL query created and the correct result produced.	6 marks	
Question 9		/6
The required SQL query created and the correct result produced.	6 marks	
Question 10		/5
The required SQL query created and the correct result produced.	5 marks	
Question 11		/6
The required SQL query created and the correct result produced.	6 marks	

Assessment against criteria		
Criteria	**Marks**	**Score**
Question 12		/6
The required view created and the appropriate result produced.	6 marks	
Question 13		/6
The required view created and the appropriate result produced.	6 marks	
Question 14		/7
The required stored procedure created and the appropriate result produced.	7 marks	
Question 15		/8
The required stored procedure created and the appropriate result produced.	8 marks	
Question 16		/9
The required function created and the appropriate result produced.	9 marks	
Question 17		/6
The required stored procedure created and the appropriate result produced.	6 marks	
Total		**/100**