ITECH1006/5006: Database Management Systems

Aims

- To analyse and comprehend a given ER diagram and Database schema
- To implement a database based on the given ER diagram and Database scheme
- To write required SQL statements query the database
- Write SQL statements to manipulate the data in the database

Learning Objectives

In the process of this assessment task you will:

- plan, schedule and execute project tasks with a view to improving your personal productivity;
- gain awareness of the typical challenges related to the practical implementation of databases;
- learn how to used Data Definition statements to implement a database from a given ER diagram and the corresponding Database schema
- learn how to use Data Manipulation statements to query a database, and insert and update data in the tables

Due date:	**Week 11, Friday, 5pm** Submit the individual work file, named 'a2-<Surname_ID>.zip', by Week 11, Friday, 5pm via Moodle.
Late submission:	Any submission after the due date will receive **a deduction of 10% per day**, this includes weekends.
Marks:	This assignment has a total 100 marks and it is worth 20% out of the total assessment.
Extensions:	An extension will only be **considered** with supporting documentation from a health professional **and** if the problem/illness occurred **within the week prior to the due date**. If an extension is granted the extension will then equal the number of days specified on the doctor's certificate, with a maximum limit of one week.
Authorship:	This assignment is an **individual assignment** and it shall be completed by **the individual student** only. The final submission must be identifiably the work of the individual. Breaches of this requirement will result in an assignment not being accepted for assessment and may result in the offending student or students being required to present before the Disciplinary Committee.

Assignment Specification

Commonwealth Transport Services (CTS) now require a partial implementation of the design made in Assignment 1. In order to keep consistency between the assignments, database specification containing the ER diagram and the corresponding schema are provided in this document. You should create your database according to this documentation. Make sure that your implementation is consistent with this design, i. e., your table names, field names, and data types are according to the specifications provided in this document. The implementation phase includes writing SQL statements to create a database and its tables, populating the tables with appropriate test data, and writing a number of queries to create reports that can be used by the management team. You need to insert at least five records in each of the tables and ensure that each of the query returns at least one record.

Implementation of the Database and Manipulation of the Data

You are required to perform the followings tasks:

1. Create a text file named Create_<StudentID>.sql (for example, Create_3087654.sql) that will contain SQL statements to:
    I. Create a database named CTSDB<StudentID>
    II. Create all of the tables for the database according to the Database schema given at the end of this document
2. Create a text file named Insert_<StudentID>.sql that will contain SQL statements to:
    I. Insert at least five records in each of the tables. The test data inserted into the table must ensure that each of the queries, specified in Task 3, outputs at least one record
3. Create a text file named Query_<StudentId>.sql that will contain all the queries to display the following
    I. A list of available Vehicles sorted according to seating capacity. Display the Model, Registration number, and the Seating capacity.
    II. A list of Official sorted according to their First name followed by Last name. Display their country name as well as the languages they speak.
    III. List the drivers who speak French. Display their First name and Last name.
    IV. List the drivers having first aid training. Display their First name, Last name, First aid level, and the Date the training was completed
    V. List the drivers having special security training. Display their First name, Last name, First aid level, the Date the training was completed, and the Name of the certifying body.
    VI. Find the vehicles which went for repair and/or maintenance in March 2015. Show their Registration number, Model, and the date of maintenance group by maintenance type.
    VII. Find the total cost incurred for maintenance and repair. Display type of maintenance and the total cost.

VIII. Find the vehicles whose repair cost was more than the average repair cost.

IX. Find the locations whose street name starts with 'B'.

X. List the names of the drivers who has Security clearance level above T and who speak English. Display their First name, Last name, and the Security clearance level.

4. Create a text file named Transaction_<StudentId>.sql that will perform the followings. Make appropriate assumption if needed.

   I. An Official named Daniel Ortega from UK, having OfficialID AUS997, wants to make a booking. He speaks English and he will play role of a 'Judge' in the games. He wants to travel from 10 Elizabeth St, Brisbane to 117 Kings Road, Gold Coast on April 9, 2015. His expected start time is 10:00 am and end time is 1:15 pm.

   II. The above trip was performed using the vehicle having VIN number SANFDAE11U1286116. The starting odometer reading for the vehicle was 26982 KM. The trip started at 10:15 and ended at 1:30 pm. At the end of the trip the odometer reading was 27190 KM. The driver for the trip was John Arnold having Driver licence number 098674432. John Arnold, although has a First Aid training (level D), completed on August 17, 2013, he does not have a special security clearance. John Arnold also speaks English.

You are required to adhere to the following output formatting conventions:

- All *monetary* values should be printed with a dollar symbol ($), two digits after the decimal point, and with space for 7 digits before the decimal point
- You must use consistent and legible formatting in laying out your SQL queries. Include (brief) comments for any query or procedure that uses an "unusual" approach.

What to submit

An electronic copy of your assignment should be submitted through Moodle and should include a copy of your report, completed according to the Federation University Australia Guide for the Presentation of Academic Work and the **four** files described in Task 1 – Task 4 above. Zip all the files into a single file before uploading.

Your report should include:

- A copy of the SITE Assignment Coversheet that includes a copy of the plagiarism statement.
- A report of the results from running the SQL queries (Task 3) by using Copy/paste of their output.
- A bibliography containing a list of all resources used to complete the assignment. If no resources, apart from the course materials, have been used please indicate this.

Assessment Criteria

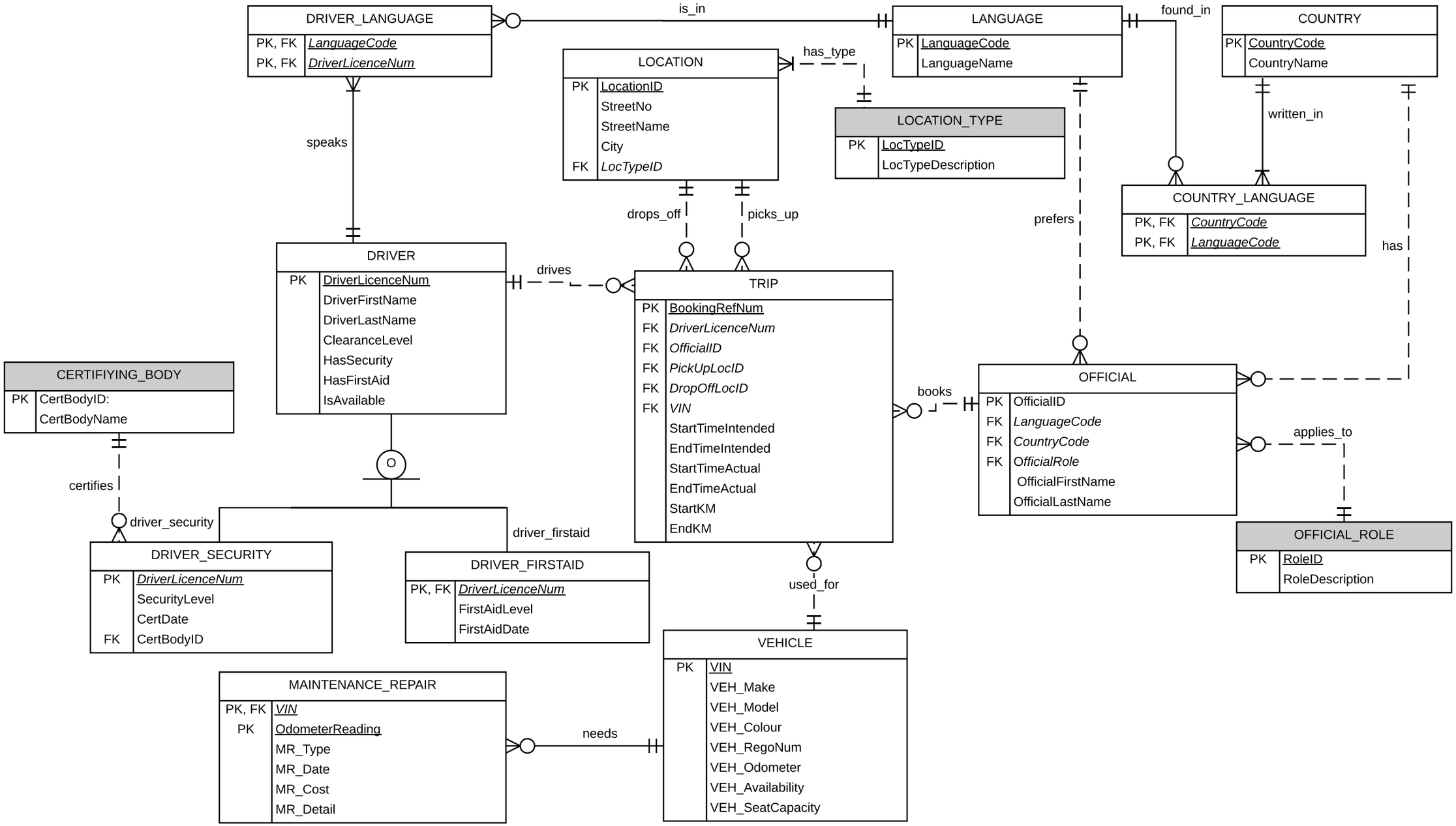
- How clear and well organised your presentation is. On the front page of your report you should include a list of acknowledgements of all people who have assisted you with this assignment including fellow students, along with a statement of completion.
- Adherence to our standards. How clear and well organised your presentation is. You should write all the queries in consistent style and *use indent format*.
- Data correctness and quality. Please use appropriate data for your examples (e.g. do not use inappropriate person names)
- Joining of data from multiple tables should be completed using a WHERE statement only. JOINs are not to be used within any of the SQL statements. Use of any JOINs will result in **0 (zero)** marks being allocated for each SQL statement that utilizes them.
- Please refer to the provided marking guide (below) to see the distribution of marks.

Assignment Resources

- The Standard ER Diagram
- Relational Database Schema

Assessment Criteria and Marking Overview

ITEM	Marks
1. Presentation How clear and well-presented your submission is.	**10**
2. Creation of database and tables (Task 1) Create the relevant tables: Database correctly named and created, includes all of the PKs and FKs in the database. No evidence that tables have been created using the GUI. They work properly	**20**
3. Insertion (Task 2) Successfully inserts data into the tables. NO evidence exporting from GUI. They work properly.	**30**
4. Query (Task 3) Use of appropriate query statement. They work as intended	**30**
5. Transaction (Task 4) Use of appropriate query statement to perform the required actions. They work as intended	**10**
Total	**100**


DRIVER_LANGUAGE
PK, FK LanguageCode
PK, FK DriverLicenceNum
is_in
LANGUAGE
PK LanguageCode
LanguageName
found_in
COUNTRY
PK CountryCode
CountryName
written_in
LOCATION
PK LocationID
StreetNo
StreetName
City
FK LocTypeID
has_type
LOCATION_TYPE
PK LocTypeID
LocTypeDescription
speaks
drops_off
picks_up
prefers
COUNTRY_LANGUAGE
PK, FK CountryCode
PK, FK LanguageCode
has
DRIVER
PK DriverLicenceNum
DriverFirstName
DriverLastName
ClearanceLevel
HasSecurity
HasFirstAid
IsAvailable
drives
TRIP
PK BookingRefNum
FK DriverLicenceNum
FK OfficialID
FK PickUpLocID
FK DropOffLocID
FK VIN
StartTimeIntended
EndTimeIntended
StartTimeActual
EndTimeActual
StartKM
EndKM
books
OFFICIAL
PK OfficialID
FK LanguageCode
FK CountryCode
FK OfficialRole
OfficialFirstName
OfficialLastName
applies_to
OFFICIAL_ROLE
PK RoleID
RoleDescription
CERTIFIYING_BODY
PK CertBodyID:
CertBodyName
certifies
O
driver_security
driver_firstaid
DRIVER_SECURITY
PK DriverLicenceNum
SecurityLevel
CertDate
FK CertBodyID
DRIVER_FIRSTAID
PK, FK DriverLicenceNum
FirstAidLevel
FirstAidDate
used_for
VEHICLE
PK VIN
VEH_Make
VEH_Model
VEH_Colour
VEH_RegoNum
VEH_Odometer
VEH_Availability
VEH_SeatCapacity
MAINTENANCE_REPAIR
PK, FK VIN
PK OdometerReading
MR_Type
MR_Date
MR_Cost
MR_Detail
needs

ERD to Relational Database Schema

Entity	Field Name	Datatype	Length	
LANGUAGE	LanguageCode	CHAR	2	Primary Key
	LanguageName	VARCHAR	50	
COUNTRY	CountryCode	CHAR	2	Primary Key
	CountryName	VARCHAR	50	
COUNTRY_LANGUAGE	CountryCode	CHAR	2	Primary Key, Foreign Key References COUNTRY (CountryCode)
	LanguageCode	CHAR	2	Primary Key, Foreign Key References LANGUAGE (LANGUAGECode)
LOCATION	LocationID	INT (AUTO)		Primary Key
	StreetNo	VARCHAR	5	
	StreetName	VARCHAR	50	
	City	VARCHAR	30	
	LocTypeID	CHAR	2	Foreign key references LOCATION_TYPE (LocTypeID)
LOCATION_TYPE	LocTypeID	CHAR	2	Primary key
	LocTypeDescription	VARCHAR	40	
DRIVER	DriverLicenceNum	CHAR	18	Primary Key
	DriverFirstName	VARCHAR	20	
	DriverLastName	VARCHAR	20	
	ClearanceLevel	CHAR	1	
	HasSecurity	CHAR	1	
	HasFirstAid	CHAR	1	
	IsAvailable	CHAR	1	
DRIVER_LANGUAGE	LanguageCode	CHAR	2	Primary Key, Foreign Key References LANGUAGE (LANGUAGECode)
	DriverLicenceNum	CHAR	18	Primary Key, Foreign Key References DRIVER (DriverLicenceNum)
DRIVER_SECURITY	DriverLicenceNum	CHAR	18	Primary Key, Foreign Key References DRIVER (DriverLicenceNum)
	CertBodyID	INT		Foreign Key References CERTIFYING_BODY (CertBodyID)
	SecurityLevel	CHAR	1	

	CertDate	DATE		

Entity	Field Name	Datatype	Length	
CERTIFYING_BODY	CertBodyID	INT (AUTO)		Primary key
	CertBodyName	VARCHAR	50	
DRIVER_FIRSTAID	DriverLicenceNum	CHAR	18	Primary Key, Foreign Key References DRIVER (DriverLicenceNum)
	FirstAidLevel	CHAR	1	
	FirstAidDate	DATE		
VEHICLE	VIN	CHAR	17	Primary Key
	VEH_Make	VARCHAR	30	
	VEH_Model	VARCHAR	30	
	VEH_Colour	VARCHAR	20	
	VEH_RegoNum	CHAR	6	
	VEH_Odometer	INT	6	
	VEH_Availability	CHAR	1	
	VEH_SeatCapacity	INT	2	
MAINTANANCE_REPAIR	VIN	CHAR	17	Primary Key, Foreign Key references VEHICLE(VIN)
	OdometerReading	INT	6	Primary Key
	MR_Type	CHAR	1	
	MR_Date	DATE		
	MR_Cost	DECIMAL		
	MR_Details	VARCHAR	100	
OFFICIAL	OfficialID	CHAR	8	Primary key
	LanguageCode	CHAR	2	Foreign key references LANGUAGE(LanguageCode)
	LanguageCode	CHAR	2	Foreign key references COUNTRY(CountryCode)
	OfficialFirstName	VARCHAR	40	
	OfficialLastName	VARCHAR	40	
	OfficialRole	CHAR	2	Foreign Key references OFFICIAL_ROLE (RoleID)
OFFICIAL_ROLE	RoleID	CHAR	2	Primary key
	RoleDescription	VARCHAR	40	

Entity	Field Name	Datatype	Length	
TRIP	BookingRefNum	INT	6	Primary Key
	VIN	CHAR	17	Foreign Key references VEHICLE(VIN)
	DriverLicenceNum	CHAR	18	Foreign Key References DRIVER (DriverLicenceNum)
	OfficialID	CHAR	8	Foreign key references OFFICIAL(OfficialID)
	PickUpLocID	INT		Foreign key references LOCATION(LocationID)
	DropOffLocID	INT		Foreign key references LOCATION(LocationID)
	StartTimeIntended	DATETIME		
	EndTimeIntended	DATETIME		
	StartTimeActual	DATETIME		
	EndTimeActual	DATETIME		
	StartKM	INT	6	
	EndKM	INT	6	