Unit:
Database Design and Development

Assignment title:

Harvey Car Hire

Summer 2019

Important notes

- Please refer to the Assignment Presentation Requirements for advice on how to set out your assignment. These can be found on the NCC Education *Campus*. Click on Policies and Advice in the left-hand menu and look under the Advice section.
- You must read the NCC Education documents 'What is Academic Misconduct? Guidance for Candidates' and 'Avoiding Plagiarism and Collusion: Guidance for Candidates' and ensure that you acknowledge all the sources that you use in your work. These documents are available on *Campus*. Click on Policies and Advice in the left-hand menu and look under the Policies section.
- You **must** complete the **'Statement and Confirmation of Own Work'**. The form is available on *Campus*. Click on Policies and Advice in the left-hand menu and look under the Policies section.
- Please make a note of the recommended word count. You could lose marks if you write 10% more or less than this.
- You must submit a paper copy and digital copy (on disk or similarly acceptable medium). Media containing viruses, or media that cannot be run directly, will result in a fail grade being awarded for this assessment.
- All electronic media will be checked for plagiarism.

Introduction

This assignment is a number of parts. All parts of the assessment relate to the Harvey Car Hire scenario below.

Scenario

Harvey Car Hire is a vehicle hire company based in London, United Kingdom. They want you to develop a new database for their core business. This summary and the examples of data that following it may be taken as indicating aspects of the system requirements for this assignment.

Harvey Car Hire rents cars and other motorised vehicles to corporate customers in large numbers. A customer will have one or more fleets of vehicles, which will consist of one or more vehicles. Vehicles are defined as being of a particular type such as small car, medium car, large car or van.

As well as renting the cars Harvey Car Hire manage the fleets for their customers. A particular vehicle will be assigned by a driver. The terms of that assignment are defined as a rental arrangement. Rental arrangements are defined by type (‘One-off’, ’Monthly’, ’Duration of Contract’ and ’Other’).

Harvey Car Hire also oversees the maintenance of the vehicles by carrying out repairs when they are needed.

A vehicle repair will involve one or more members of staff, and can involve one or more parts.

The system should be capable of storing all the information needed for Harvey Car Hire to carry out their business. A number of additional requirements are outlined below, including data entry and queries.

Please note also that all SQL scripts should be shown along with their results.

Please Note: The data shown in the assignment is not necessarily normalised, and that it is the candidate’s task to organise the data in the most optimal way possible. For example, the paper records shown below will not necessarily map directly to database tables. The candidate is expected to use these tables as a starting point for their own normalisation and optimisation of the Harvey Car Hire system.

Please state any assumptions you have made about the scenario.

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Below are a sample of the paper records currently kept by Harvey Car Hire. They should be taken as representative of a much larger data set.

1. Vehicle Fleet Records

Fleet ID	Customer ID	Customer Name	Vehicle Model	Vehicle Registration	Vehicle Type Code	Vehicle Type Description
201	23	Ricardo Enterprises	Ford Focus	S10 URP	Small Car	Any super-mini, small family car or city car.
201	23	Ricardo Enterprises	Kia Picanto	S30 KLL	Small Car	Any super-mini, small family car or city car.
201	23	Ricardo Enterprises	Fort Transit	S123 UTT	Van	Any van
203	23	Ricardo Enterprises	BMW 5 Series	S20 UYT	Large Car	Any people mover, small or large MPV
203	23	Ricardo Enterprises	Kia Picanto	L99 5TT	Small Car	Any super-mini, small family car or city car.
301	11	Brown Estate Agents	Ford Transit	L87 WXH	Van	Any van
301	11	Brown Estate Agents	Fiat Uno	S20 UHH	Small Car	Any super-mini, small family car or city car.
400	12	White Holdings	Chevrolet Malibu	S50 RSE	Medium Car	Midsized, intermediate or large family car

NOTE: Ricardo Enterprises has two different fleets.

2. Rental Arrangement

Driver ID	**Driver Name**	**Rental Arrangement Type**	**Fleet ID**	**Start Date**	**End Date**	**Vehicle Registration**
D77	Leon Garfield	One-off	201	01-MAR-2017	01-MAR-2018	S10 URP
D99	Oliver Morton	One-off	201	01-MAR-2017	01-MAR-2018	S30 KLL

D81	Edgar West	Duration of Contract	201	03-APR-2017		S123 UTT
D99	Mavis Cutter	Other	203	01-MAR-2017	01-MAR-2021	S20 UYT
D100	Mark Smith	Other	203	01-MAR-2017	01-DEC-2017	L99 5TT
D101	Jeff Moon	Monthly	301	01-FEB-2017	02-MAR-2018	L87 WXH

Document 3. Vehicle Repair Sheet

Vehicle Registration: L87 WXH
Repair Number: 3
Name of Driver: Jeff Moon
Address of Driver: 80 Kestrel Rd, SE15 6NQ
Date of Repair: 01/03/17

Parts Used

Part Code	Part Name	Quantity
BL	Back Lights	2
FW	Front Window screen	1
BW	Back Window screen	1
SB	Seat Belt	

Staff

Staff ID	Name
S78	Dave Smith
S23	Holly Leman

Note

This document is for a single repair event on the given date. A repair event may use a number of different parts as indicated. It may involve one or more staff.

Over time each vehicle may have a number of different repairs and this is indicated by a repair number. Therefore the unique identifier for each repair event would be the combination of the vehicle registration and the repair number.

End of Case Study

Task 1 – 35 Marks

a. Produce an entity relationship model for the proposed database system for Harvey Car Hire **(15 marks)**
b. Provide a discussion of the normalisation taken to produce a set of third normal form relations for the proposed system. You should explain normalisation **and** how you have applied it. **(10 marks)**
c. Produce a data dictionary for your proposed system. **(10 marks)**

Task 2 – 30 Marks

a) Create the tables in SQL and show the CREATE scripts as running in the programming environment. **(5 marks)**
b) Create data on all the customers, fleets and vehicles. Provide a screen shot of the data. **(1 mark).**
c) Create data for drivers shown in assignment. Provide a screen shot of the data **(1 mark).**
d) Create data on all the fleets. Provide a screen shot of the data. **(1 mark)**
e) Create data showing all the staff. Provide a screen shot of the data. **(1 mark)**
f) Write a query that selects the registration numbers for all small cars in the fleet for customer Brown Estate Agents. **(3 marks).**
g) Write a query that selects the start dates for all vans in every fleet. **(3 marks).**
h) Write a query that shows the details of the repairs shown in document 3. **(3 marks).**
i) Write a query that counts all the vehicles of type 'van' **(3 marks).**
j) Write a query to select driver name, fleet id and vehicle registration for all rental arrangements that began on the 1st of March 2017 (**3 marks).**
k) Update the driver's name 'Mavis Cutter' to 'Mavis Drinkfield'. **(3 marks).**
l) Alter the database so that it keeps a record of insurance document id numbers for all drivers. **(3 marks)**

Task 3 – 15 Marks

The company have said they would like to extend the database to include costing information for repair work on vehicles. Data should be kept on the cost of paying staff and providing parts. There should be a way of recording how much routine and one-off maintenance work on vehicles will cost. You should include an outline of how you would derive costing information using SQL and specify the method of implementing any changes required to derive this costing information.

Task 4 – 10 marks

In the future Harvey Car Hire could expand as an organisation by merging with other companies across the UK and the Republic of Ireland. Describe the factors that might make them consider implementing a distributed database.

Task 5 – 10 Marks

Give an evaluation of how the work you have done has met the requirements of the company. This should include data storage and applications. Please identify any assumptions you have made.

Submission requirements

- Your submission should be in the form of a single word-processed document that includes any necessary diagrams.
- The word count for the document is **2000 words** (excluding text in any diagrams). You should explain any assumptions you have made.
- A digital version must be submitted on a CD, USB flash drive or other similarly acceptable medium, **along with a copy of the developed database**.

Candidate checklist

Please use the following checklist to ensure that your work is ready for submission.

Have you read the NCC Education documents 'What is Academic Misconduct? Guidance for Candidates' and 'Avoiding Plagiarism and Collusion: Guidance for Candidates' and ensured that you have acknowledged all the sources that you have used in your work?	❑
Have you completed the 'Statement and Confirmation of Own Work' form and attached it to your assignment? **You must do this.**	❑
Have you ensured that your work has not gone over or under the recommended word count by more than 10%?	❑
Have you ensured that your work does not contain viruses and can be run directly?	❑