Assignment Part 2:
Designing a Database for Commonwealth Transport Services

ASSIGNMENT TITLE: Designing a Database for Commonwealth Transport Services

Student ID: S5129196   **Student Name: Wenjin Li**

Course Code: 7003ICT   **Course Name: Database Management**

Date Submitted: 9 Jan 2017   **Lecturer's Name: Sen Wang**

Tutor's Name: Douglas Alves Peixoto

Marks obtained: _____. [For marker to fill up.]

Note: If you are submitting the assessment online at L@G, you do not need to sign and scan this page. Your online submission will be considered as your signature above.

Table of Contents

Contents

List of Illustrations

Acknowledgements:

1) Wenchao Hu
2) Satish Kumar Roy Kader
3) Frank Obi

Relational Database Schema in Task 1

Table Name	Field	Type	Description
DRIVER	DriverLicenseNum	INT(9)	PRIMARY KEY
	FirstName	VARCHAR(20)	NOT NULL
	LastName	VARCHAR(20)	NOT NULL
	ClearanceLevel	SMALLINT(2)	NOT NULL
	Availability	CHAR (1)	NOT NULL
LANGUAGE	LanguageCode	CHAR(2)	PRIMARY KEY
	LanguageName	VARCHAR(30)	NOT NULL
OFFICIALROLE	RoleID	SMALLINT (2)	PRIMARY KEY
	RoleDescription	VARCHAR(20)	NOT NULL
OFFICIAL	OfficialID	INT(8)	PRIMARY KEY
	RoleID	SMALLINT(2)	FOREIGN KEY REFERENCES OFFICIALROLE(RoleID)
	FirstName	VARCHAR(20)	NOT NULL
	LastName	VARCHAR(20)	NOT NULL
VEHICLE	VIN	CHAR(17)	PRIMARY KEY
	Rego	CHAR(6)	NOT NULL
	Make	VARCHAR(10)	
	Model	VARCHAR(10)	
	Colour	VARCHAR(10)	
	Odometer	INT(7)	
	SeatCapacity	SMALLINT(1)	
	Availability	CHAR (1)	NOT NULL
SUBURB	SuburbID	SMALLINT(2)	PRIMARY KEY
	SuburbName	VARCHAR(20)	NOT NULL
	Postcode	INT(4)	NOT NULL
LOCATION	LocationID	SMALLINT(2)	PRIMARY KEY
	SuburbID	SMALLINT(2)	FOREIGN KEY REFERENCES SUBURB(SuburbID)
	LocationName	VARCHAR(20)	NOT NULL
DRIVERLANGUAGE	LanguageCode	CHAR(2)	PRIMARY KEY FOREIGN KEY REFERENCES LANGUAGE(LanguageCode)
	DriverLicenseNum	INT(9)	PRIMARY KEY FOREIGN KEY REFERENCES DRIVER(DriverLicenseNum)

	Proficiency	SMALLINT(2)	NOT NULL
OFFICIALLANGUAGE	LanguageCode	CHAR(2)	PRIMARY KEY FOREIGN KEY REFERENCES LANGUAGE(LanguageCode)
	OfficialID	INT(8)	PRIMARY KEY FOREIGN KEY REFERENCES OFFICIAL(OfficialID)
	Proficiency	SMALLINT(2)	NOT NULL
TRIP	BookingRefNum	INT(5)	PRIMARY KEY NOT NULL
	DriverLicenseNum	INT(9)	FOREIGN KEY REFERENCES DRIVER(DriverLicenseNum)
	OfficialID	INT(8)	FOREIGN KEY REFERENCES OFFICIAL(OfficialID)
	PickupLocID	SMALLINT(2)	FOREIGN KEY REFERENCES LOCATION(LocationID)
	DropOffLocID	SMALLINT(2)	FOREIGN KEY REFERENCES LOCATION(LocationID)
	VIN	CHAR(17)	FOREIGN KEY REFERENCES VEHICLE(VIN)
	StartTime	DATE	Format: DD-MM-YY
	EndTime	DATE	Format: DD-MM-YY
	StartKM	INT(7)	
	EndKM	INT(7)	

Table 1 Relational Database Schema

Reports on SQL Queries in Task 4

Queries for both 1804ICT and 7003ICT students:

Query 1: *A list of available Vehicles sorted according to seating capacity (in a descending order) . In your returned query results, you should display the make, model, VIN number, and the s eat capacity.*

SELECT Make, Model, VIN, SeatCapacity
From VEHICLE
WHERE Availability = 'Y'
ORDER BY SeatCapacity DESC

Output table:

Make	Model	VIN	SeatCapacity ▾ 1
Toyota	Camry	6T1BD3FK1098DUY71	5
Toyota	Corolla	JTNKU3JE501W87362	5
Hyundai	i30	KMHDL51ULGU13678K	5
Audi	A1	WAUZZZ8X2E19DWS19	3
Toyota	Hilux	MR0FZ29GX0087UXY5	2
Mercedes	Sprinter	WDB9066552S29AL2T	2

Figure 1 Query 1 Output

Query 2: *Find the locations whose location name consists of two or more words. The last word is four-character long ending with a 'd'. Display location id, names, suburb name and postcode.*

SELECT Loc.LocationID as 'Location ID', Loc.LocationName as 'Location Name', S.suburbName as 'Suburb Name', S.Postcode
FROM LOCATION as Loc, SUBURB as S
WHERE Loc.SuburbID = S.SuburbID
AND LocationName LIKE '_% ___d%';

Output table:

Location ID	Location Name	Suburb Name	Postcode
11	Wet and Wild	Oxenford	4210

Figure 2 Query 2 Output

Query 3: *A list of officials sorted according to their first name followed by last name. Display their full names (separated by a whitespace), and the language names they speak.*

SELECT CONCAT(O.FirstName, ' ', O.LastName) AS 'Full Name', L.LanguageName
FROM OFFICIAL AS O, LANGUAGE as L, OFFICIALLANGUAGE as OL
WHERE O.OfficialID = OL.OfficialID
        AND L.LanguageCode = OL.LanguageCode
ORDER BY O.FirstName, O.LastName

Output table:

Full Name	LanguageName
Aaron Mooy	English
Aaron Mooy	Hindi
Jackson Irvine	Chinese
Josh Risdon	Spanish
Mark Milligan	English
Mark Milligan	Hindi
Mathew Ryan	Chinese
Matthew Jurman	Chinese
Mile Jedinak	English
Mile Jedinak	Spanish
Mile Jedinak	Hindi
Milos Degenek	English
Mitchell Langerak	Chinese
Robbie Kruse	English
Robbie Kruse	Spanish
Ryan McGowan	Chinese
Tim Cahill	English
Tim Cahill	Spanish
Tim Cahill	Hindi
Tom Rogic	Chinese
Tomi Juric	English
Tomi Juric	Spanish
Trent Sainsbury	Chinese

Figure 3 Query 3 Output

Query 4: *A list of all officials who have not made any booking request yet. Display the officials' full names (separated by a whitespace) and the description of their roles.*

SELECT CONCAT(O.FirstName, ' ',O.LastName) as 'Official Name', R.RoleDescription
FROM OFFICIAL as O, OFFICIALROLE as R
Where O.RoleID = R.RoleID
        AND O.OfficialID not in (SELECT DISTINCT OfficialID from TRIP)

Output table:

Official Name	RoleDescription
Mitchell Langerak	competitor
Josh Risdon	physiotherapist
Tom Rogic	sports agent
Ryan McGowan	personal trainer

Figure 4 Query 4 Output

Query 5: *Find the trip records whose distances are more than the average trip distance. In your returned query results, you need to display all the columns in trip table.*

SELECT * FROM TRIP
WHERE (EndKM - StartKM) > (SELECT AVG(EndKM - StartKM) FROM TRIP)

Output table:

BookingRefNum	DriverLicenseNum	OfficialID	PickupLocID	DropOffLocID	VIN	StartTime	EndTime	StartKM	EndKM
14	123109789	10988772	8	7	MR0FZ29GX0087UXY5	2018-04-04 13:00:00	2018-04-04 14:00:00	150000	150500
17	951280132	10988778	14	13	JTNKU3JE501W87362	2018-04-04 12:00:00	2018-04-04 13:45:00	25200	25750
20	787612436	10988767	6	6	MR0FZ29GX0087UXY5	2018-04-04 16:00:00	2018-04-04 18:45:00	150500	151000
21	123109789	10988768	8	8	KMHDL51ULGU13678K	2018-04-04 15:00:00	2018-04-04 17:30:00	5150	6000
23	109229312	10988770	12	12	JTNKU3JE501W87362	2018-04-04 19:00:00	2018-04-04 22:30:00	25750	26500
24	609532388	10988771	14	14	WDB9066552S29AL2T	2018-04-04 21:00:00	2018-04-04 23:00:00	90300	91000
25	787612436	10988772	2	13	KMHDL51ULGU13678K	2018-04-04 18:00:00	2018-04-04 23:15:00	6000	7500

Figure 5 Query 5 Output

Query 6: *Show the trip records whose durations are more than half an hour in a descending order of BookingRefNum (primary key). In your returned query results, show all columns of trip table*

SELECT *
FROM TRIP
WHERE TIMEDIFF(EndTime, StartTime) > '00:30:00'
ORDER BY BookingRefNum DESC

Output table:

BookingRefNum ▽ 1	DriverLicenseNum	OfficialID	PickupLocID	DropOffLocID	VIN	StartTime	EndTime	StartKM	EndKM
25	787612436	10988772	2	13	KMHDL51ULGU13678K	2018-04-04 18:00:00	2018-04-04 23:15:00	6000	7500
24	609532388	10988771	14	14	WDB9066552S29AL2T	2018-04-04 21:00:00	2018-04-04 23:00:00	90300	91000
23	109229312	10988770	12	12	JTNKU3JE501W87362	2018-04-04 19:00:00	2018-04-04 22:30:00	25750	26500
22	192092248	10988769	10	10	WAUZZZ8X2E19DWS19	2018-04-04 20:00:00	2018-04-04 22:00:00	100100	100350
21	123109789	10988768	8	8	KMHDL51ULGU13678K	2018-04-04 15:00:00	2018-04-04 17:30:00	5150	6000
20	787612436	10988767	6	6	MR0FZ29GX0087UXY5	2018-04-04 16:00:00	2018-04-04 18:45:00	150500	151000
19	609532388	10988766	4	4	6T1BD3FK1098DUY71	2018-04-04 17:00:00	2018-04-04 18:00:00	35300	35500
17	951280132	10988778	14	13	JTNKU3JE501W87362	2018-04-04 12:00:00	2018-04-04 13:45:00	25200	25750
15	192092248	10988774	10	9	KMHDL51ULGU13678K	2018-04-04 11:00:00	2018-04-04 11:45:00	5000	5150
14	123109789	10988772	8	7	MR0FZ29GX0087UXY5	2018-04-04 13:00:00	2018-04-04 14:00:00	150000	150500
13	787612436	10988770	6	5	6T1BD3FK1098DUY71	2018-04-04 10:00:00	2018-04-04 11:15:00	35000	35300
12	609532388	10988768	4	3	WDB9066552S29AL2T	2018-04-04 09:00:00	2018-04-04 10:00:00	90000	90250

Figure 6 Query 6 Output

Additional queries for 7003ICT students only:

Query 7: *List the drivers who have driven more than 1000 KM in total. Display their full names and total kilometres travelled. Show the list sorted by total kilometre travelled.*

SELECT CONCAT(DRIVER.FirstName, ' ', DRIVER.LastName) AS 'Driver Name', SUM(EndKM - StartKM) AS 'Total Travelled Distance'
FROM TRIP, DRIVER
WHERE TRIP.DriverLicenseNum = DRIVER.DriverLicenseNum
GROUP BY TRIP.DriverLicenseNum
HAVING SUM(EndKM - StartKM) > 1000

Output table:

Driver Name	Total Travelled Distance
Jacob Williams	1350
Liam Jones	1150
Mason Taylor	2300

Figure 7 Query 7 Output

Query 8: *Find the trips whose pick-up location name and drop-off location name are the same (arrival = departure). Display the full names of the Drivers, full name of the Officials, and the pick-up and drop-off locations.*

SELECT CONCAT(O.FirstName, ' ', O.LastName) AS 'Official Name', CONCAT(D.FirstName, ' ', D.LastName) AS 'Driver Name', Loc.LocationName as 'Pick-up', Loc.LocationName as 'Drop-Off'
FROM TRIP as T, DRIVER as D, OFFICIAL as O, LOCATION as Loc
WHERE T.DriverLicenseNum = D.DriverLicenseNum AND
      T.OfficialID = O.OfficialID AND
      T.PickupLocID = L.LocationID AND
      T.DropOffLocID = L.LocationID AND
      T.PickupLocID = T.DropOffLocID

Output table:

Official Name	Driver Name	Pick-up	Drop-Off
Mark Milligan	Noah Smith	Griffith GC	Griffith GC
Tomi Juric	Jacob Williams	Gold Coast Airport	Gold Coast Airport
Aaron Mooy	James Evans	Griffith Nattan	Griffith Nattan
Mile Jedinak	Liam Jones	Australia Fair	Australia Fair
Milos Degenek	Liam Jones	Sky Point	Sky Point
Robbie Kruse	Mason Taylor	Beenleigh Station	Beenleigh Station

Figure 8 Query 8 Output

Query 9: *A list of available drivers and officials who speak the same language and the exact the same language proficiency in a descending order of proficiency. In your returned query results, driver license number, driver's full name (separated by a whitespace), availability of driver, official commonwealth id, official name, and matched language proficiency.*

SELECT D.DriverLicenseNum, CONCAT(D.FirstName, ' ', D.LastName) as 'Driver Name', D.Availability as 'Driver Availability', O.OfficialID as 'Official Commonwealth ID', CONCAT(O.FirstName, ' ', O.LastName) as 'Official Name', DL.Proficiency as 'Matched Proficiency'
FROM DRIVER as D, OFFICIAL as O, DRIVERLANGUAGE as DL, OFFICIALLANGUAGE as OL, LANGUAGE AS L
WHERE D.Availability = 'Y' AND
       D.DriverLicenseNum = DL.DriverLicenseNum AND
       O.OfficialID = OL.OfficialID AND
       DL.LanguageCode = L.LanguageCode AND
       OL.LanguageCode = L.LanguageCode AND
       DL.Proficiency = OL.Proficiency
ORDER BY DL.Proficiency DESC

Output table:

DriverLicenseNum	Driver Name	Driver Availability	Official Commonwealth ID	Official Name	Matched Proficiency
609532388	Liam Jones	Y	10988779	Josh Risdon	10
104587912	Alexander Wilson	Y	10988771	Milos Degenek	10
109229312	Noah Smith	Y	10988776	Jackson Irvine	10
192092248	James Evans	Y	10988773	Mitchell Langerak	10
192092248	James Evans	Y	10988778	Trent Sainsbury	10
609532388	Liam Jones	Y	10988767	Robbie Kruse	10
109229312	Noah Smith	Y	10988774	Mathew Ryan	10
109229312	Noah Smith	Y	10988771	Milos Degenek	10
123109789	Jacob Williams	Y	10988779	Josh Risdon	10
192092248	James Evans	Y	10988776	Jackson Irvine	10
787612436	Mason Taylor	Y	10988771	Milos Degenek	10
109229312	Noah Smith	Y	10988772	Matthew Jurman	10
109229312	Noah Smith	Y	10988777	Ryan McGowan	10
123109789	Jacob Williams	Y	10988767	Robbie Kruse	10
192092248	James Evans	Y	10988774	Mathew Ryan	10
609532388	Liam Jones	Y	10988768	Tomi Juric	10
109229312	Noah Smith	Y	10988775	Tom Rogic	10
192092248	James Evans	Y	10988772	Matthew Jurman	10
192092248	James Evans	Y	10988777	Ryan McGowan	10
951280132	Michael Thomas	Y	10988771	Milos Degenek	10
109229312	Noah Smith	Y	10988773	Mitchell Langerak	10
109229312	Noah Smith	Y	10988778	Trent Sainsbury	10
123109789	Jacob Williams	Y	10988768	Tomi Juric	10
192092248	James Evans	Y	10988775	Tom Rogic	10
609532388	Liam Jones	Y	10988766	Mile Jedinak	8

Figure 9 Query 9 Output

Bibliography

Coronel, C., & Morris, S. (2016). Database systems: Design, implementation, and management (Twelfth ed.). Boston, Mass: Cengage Learning.