



MACQUARIE
University
SYDNEY · AUSTRALIA

SCHOOL OF COMPUTING

COMP1350 2023 – ASSIGNMENT TWO

Introduction to Database Design and Management

Database Implementation Assignment

(Worth 20%: 5% Submission; 15% Viva Assessment)

5% Submission due: 11:55 pm, Sunday 15th October 2023 (WEEK 10 SUNDAY)
15% Viva Assessment due in YOUR Week 11 SGTA/Workshop

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Case Background

With your assistance, the South African Conservation Society has moved to relational databases. However, members of their IT department did not pay attention during COMP1350 classes and are now having trouble with creating tables and writing queries. You have been employed to construct and implement the database and write queries for some common searches on the database.

Table Num:1 Table Name: <i>Reserve</i>	
Column Name	Comments/Description
<u>ReserveID (PK)</u>	The unique identifier for the reserve.
ReserveName	A short name for the reserve.
ReserveLocation	The name of the reserve location
ReserveSize	Size of the land in hectares.

Data for Reserve

	ReserveID	ReserveName	ReserveLocation	ReserveSize
►	R1	Dwesa-Cwebe Nature Reserve	Eastern Cape Province	545
	R2	Caledon Nature Reserve	Free State	230
	R3	Hluhluwe–Umfolozi Game Reserve	KwaZulu-Natal	960
	R4	Kruger National Park	Mpumalanga	999
	R5	De Hoop Nature Reserve	Overberg	340
	R6	Pilanesberg National Park	North West Province	572
	R7	Blyde River Canyon Nature Reserve	Mpumalanga	290

Table Num:2 Table Name: <i>Vehicle</i>	
Column Name	Comments/Description
<u>VehicleID (PK)</u>	The unique identifier for the vehicle.
<u>ReserveID (PK, FK)</u>	The unique identifier for the reserve <i>References ReserveID in the Reserve table.</i>
VehicleType	A short name/description for the type of vehicle
VehicleCapacity	Maximum number of passengers.
VehicleRegoNum	Registration of the vehicle; 6 alphanumeric values.

Data for Vehicle

	VehicleID	ReserveID	VehicleType	VehicleCapacity	VehicleRegoNum
►	V1	R1	Bus	15	AVH287
	V1	R2	Off-road 4WD	8	FNG552
	V1	R3	Off-road 4WD	8	MQR858
	V1	R4	Off-road 4WD	8	LMV199
	V1	R5	Van	10	KEV022
	V2	R1	Ute with cage	6	JQB042
	V2	R3	Van	10	BGC222
	V2	R4	Van	10	HTO587
	V2	R5	Ute with cage	6	HMG835
	V3	R3	Bus	15	ZZB964
	V3	R4	Bus	15	UFB445

Table Num:3 Table Name: Tour	
Column Name	Comments/Description
<u>TourID (PK)</u>	The unique identifier for the tour.
TourName	A short name/description for the tour.
TourCost	Cost of the tour.
TourDuration	Duration of tour in hours.

Data for Tour

	TourID	TourName	TourCost	TourDuration
▶	T1	Premium Tour Package	500.00	6
	T2	Standard Tour Package	420.00	5
	T3	Whale Watching	200.00	3
	T4	Hiking and Biking	150.00	1
	T5	Safari	250.00	2
	T6	Lake Cruise	300.00	2
	T7	Shark Diving	250.00	2

Table Num:4 Table Name: Staff	
Column Name	Comments/Description
<u>StaffID (PK)</u>	The unique identifier for the staff member
StaffName	The name of the staff member
StaffPosition	A short name/description for the position of the staff member
StaffSalary	Staff member's annual salary.

Data for Staff

	StaffID	StaffName	StaffPosition	StaffSalary
▶	S1	Blake Lively	Reserve Manager	120000.00
	S2	Heath Ledger	Tour Guide	70000.00
	S3	Sheldon Cooper	Tour Guide	70000.00
	S4	Jessica Chastain	Senior Tour Guide	80000.00
	S5	Joaquin Phoenix	Junior Tour Guide	90000.00

Table Num:5 Table Name: VisitorGroup	
Column Name	Comments/Description
<u>VisGroupID (PK)</u>	Unique identifier for the Visitor Group.
VisGroupName	The name of the person who registered the group.
VisGroupCountry	Name of the country the group will be travelling from.
VisGroupNumPeople	Number of members in the group.

Data for VisitorGroup

	VisGroupID	VisGroupName	VisGroupCountry	VisGroupNumPeople
▶	VG1	Hugh Jackman	Australia	1
	VG2	Zoe Bell	New Zealand	7
	VG3	Nicole Kidman	Australia	5
	VG4	Jackie Chan	Hong Kong	8
	VG5	Kim SooHyun	Korea	14
	VG6	Parkmin Young	Korea	10
	VG7	Maggie Cheung	Hong Kong	3
	VG8	JunJi Hyun	Korea	6

Table Num:6 Table Name: Booking	
Column Name	Comments/Description
BookingID (PK)	Unique identifier for the Booking.
TourID (FK)	Unique identifier for the Tour. <i>References TourID from the Tour table.</i>
VehicleID (FK)	Unique identifier for the Vehicle at a Reserve.
ReserveID (FK)	<i>References VehicleID, ReserveID from the Vehicle table.</i>
StaffID (FK)	Unique identifier for the member of Staff. <i>References StaffID from the Staff table.</i>
VisGroupID(FK)	Unique identifier for the Visitor Group. <i>References VisGroupID from the VisitorGroup Table</i>
BookingDate	The tour date booking has been made for
BookingTime	The tour time booking has been made for

Data for Booking

BookingID	TourID	VehicleID	ReserveID	VisGroupID	StaffID	BookingDate	BookingTime
B01	T4	V1	R2	VG2	S3	2024-03-29	10:28:00
B02	T4	V2	R1	VG3	S3	2024-07-14	07:23:00
B03	T5	V2	R5	VG1	S4	2023-11-04	07:40:00
B04	T1	V2	R4	VG4	S5	2024-06-23	06:42:00
B05	T1	V3	R3	VG5	S2	2024-11-25	07:13:00
B06	T7	V2	R5	VG1	S3	2024-07-08	10:55:00
B07	T5	V1	R1	VG8	S3	2024-09-04	06:06:00
B08	T3	V1	R2	VG7	S4	2023-10-14	06:37:00
B09	T2	V3	R3	VG6	S5	2024-01-01	09:07:00
B10	T3	V1	R1	VG8	S2	2024-01-18	08:35:00

Table Num:7 Table Name: Organisation	
Column Name	Comments/Description
OrganisationID (PK)	Unique identifier for the Organisation.
OrganisationName	Name of the Organisation.
OrganisationManager	First name and surname of the Organisation's manager.
OrgContactNumber	Organisation's contact number including area code.

Data for Organisation

OrganisationID	OrganisationName	OrganisationManager	OrgContactNumber
O1	Roll and Rock Corp	Elvis Presley	(60) 2775 8425
O2	BlueEyes Corp	Frank Sinatra	(70) 9175 8036
O3	Queen and Co	Freddie Mercury	(71) 9126 8504
O4	Liz Voices	Whitney Houston	(10) 9647 8708
O5	Bad Guys	Billie Eilish	(78) 6686 3940
O6	Songbird Supreme	Mariah Carey	(02) 9481 1111

Table Num:8 Table Name: Partnership	
Column Name	Comments/Description
<u>ReserveID (PK, FK)</u>	Unique identifier for the Reserve. References ReserveID from the Reserve table.
<u>OrganisationID (PK, FK)</u>	Unique identifier for the Organisation. References OrganisationID from the Organisation table.
StartDate	Date the partnership commences.
EndDate	Date the partnership ends.
Amount	Amount funded by the Organisation.

Data for Partnership

	ReserveID	OrganisationID	StartDate	EndDate	Amount
►	R1	O3	2021-08-31	2025-05-30	508485.00
	R2	O2	2023-07-20	2025-08-24	1632025.00
	R2	O6	2020-09-22	2026-04-08	1420420.00
	R3	O1	2021-09-01	2026-03-27	809930.00
	R4	O4	2022-04-30	2024-12-23	2339079.00
	R5	O5	2020-12-03	2025-09-29	1463627.00

Table Num:9 Table Name: TourPackage	
Column Name	Comments/Description
<u>PackageTourID (PK, FK)</u>	Unique identifier for the Package Tour. <i>References TourID from the Tour table.</i>
<u>ComponentTourID (PK, FK)</u>	Unique identifier for the Component Tour. <i>References TourID from the Tour table.</i>

Data for TourPackage

	PackageTourID	ComponentTourID
►	T1	T4
	T2	T4
	T1	T5
	T2	T6
	T1	T7

Understanding how the assignment works

- Please read these instructions carefully to understand how the assignment works.
- A sample schema (as a pdf file) is provided in the Assignment-2 folder. It should give you an idea of which tables are connected to which other tables.
- The assignment is broken down into 3 levels:
 - 1. Level One: 5 Questions (25 marks)**
 - 2. Level Two: 3 Questions (15 marks)**
 - 3. Level Three: 2 Questions (10 marks)**
- You will have to score full marks in **Level One** to qualify for **Level Two**, and full marks in **Level Two** to qualify for **Level Three**. This means even if you lose one mark in the previous level, your next level will not be marked.
- There are 10 (ten) questions and every question is worth 5 (five) marks.

Creating tables, Inserting data into tables:

- Comments are given for you to understand the column and do not have to be added to the database.
- A snapshot of the data your tables should contain is provided beneath the table description. This is the exact data that you must insert into the tables. No extra tables should be added.
- The creation of tables has no marks. This means you are expected to create tables and insert data for your queries to work.

Executing queries:

- The expected output of each query has been provided for you to cross-check the understanding of your question. Execution of every query must match the output provided in the same order
- If there are computed fields/fields with some calculation, the column names must have a proper alias
- Remove duplicate results, wherever applicable. You will see the expected output does just that.
- “Natural Join/Union/Intersect” phrases shall not be used within the realm of the assignment.
- If the question doesn’t specify whether to use joins or subqueries, you are allowed to either use join and/or subqueries to answer the question.

How to Submit:

- Use the template provided in the folder to write your code in MySQL under the comments provided. This will be executed on MySQLWorkbench during marking.
- Rename the file to your StudentID_StudentName (If the file is in any format other than .sql, the submission will receive zero).
- Upload the file in the link provided on iLearn before the submission date.

How the late submission penalty would work:

- The late submission penalty of 5% per day will apply to the entire assignment and not to the individual components.
- The viva assessment for students who submit after the one-hour grace period will be rescheduled in Week-13 and will incur the same late penalty that the submission receives. Late submissions are only accepted up until 7 days past the due date as provided on the unit guide.

Task Descriptions

Level-One

This level has five questions. To be able to answer the questions, you will have to create and populate tables 1-6: Reserve, Vehicle, Tour, Staff, VisitorGroup and Booking.

Task 1 (5 marks):

Write a query to print all details of the tours. The cost of the tour should be prefixed with '\$' and the duration should end with 'hours'. Sort the records from the highest to lowest based on the cost of the tour.

Expected output:

	TourID	TourName	TourCost	TourDuration
►	T1	Premium Tour Package	\$500.00	6 hours
	T2	Standard Tour Package	\$420.00	5 hours
	T6	Lake Cruise	\$300.00	2 hours
	T5	Safari	\$250.00	2 hours
	T7	Shark Diving	\$250.00	2 hours
	T3	Whale Watching	\$200.00	3 hours
	T4	Hiking and Biking	\$150.00	1 hours

Task 2 (5 marks):

Write a query to print out the details of the booking: the booking ID along with its start and end times. Rename the columns as 'Tour Start Time' and 'Tour End Time'.

Expected output:

	BookingID	Tour Start Time	Tour End Time
►	B04	06:42:00	12:42:00
	B05	07:13:00	13:13:00
	B09	09:07:00	14:07:00
	B08	06:37:00	09:37:00
	B10	08:35:00	11:35:00
	B01	10:28:00	11:28:00
	B02	07:23:00	08:23:00
	B03	07:40:00	09:40:00
	B07	06:06:00	08:06:00
	B06	10:55:00	12:55:00

Task 3 (5 marks):

Write a query to retrieve the details of the booking: the booking ID along with the booking date and the reserve name. Display only the records where the booking has been made at a reserve larger than 300 hectares, with a vehicle capable of accommodating at least seven passengers, and the booking is scheduled for more than six months from the current date.

Hint: You have to use the current date when writing the query, and consider 1 month as equivalent to 30 days.

Expected output:

	BookingID	BookingDate	ReserveName
►	B07	2024-09-04	Dwesa-Cwebe Nature Reserve
	B04	2024-06-23	Kruger National Park
	B05	2024-11-25	Hluhluwe–Umfolozi Game Reserve

Task 4 (5 marks):

Using a **SUBQUERY**, print the name and size of each reserve that has a vehicle with the letter 'b' appearing in the Rego Number (not case-sensitive). All sizes should be displayed with ' hectares' and the result should be sorted from the largest to the smallest reserve.

Expected output:

	ReserveName	ReserveSize
►	Kruger National Park	999 hectares
	Hluhluwe–Umfolozi Game Reserve	960 hectares
	Dwesa-Cwebe Nature Reserve	545 hectares

Task 5 (5 marks):

Write a query to display the total number of bookings for each reserve (Include just the IDs of the Reserve) that were made before 10:00 AM. There should be no formulas as column names. Order the results by ReserveID in ascending order.

Expected output:

	ReserveID	Bookings Per Reserve
►	R1	3
	R2	1
	R3	2
	R4	1
	R5	1

Level-Two

This level has three questions. To be able to answer the questions, you will have to create and populate tables 7,8, and 9: Partnership, Organisation, TourPackage.

Task 6 (5 marks):

Write a query to print the name of staff members along with the dates of the booking, if the bookings were made in October of any year, and only if the staff members are either reserve managers or senior tour guides earning at least \$70,000. Order the results by Staff Name in ascending order

Additionally, include staff members who do not have any bookings, and represent any null values as 'No Booking'.

Expected Output:

	StaffName	BookingDate
►	Blake Lively	No Booking
	Jessica Chastain	2023-10-14

Task 7 (5 marks):

Write a query to display the country of the visitor group and the name of the staff member assigned to the group for the booking, where the tour duration is over two hours, the assigned staff member has two or more bookings, and their salary is less than or equal to the average staff salary.

Expected Output:

	VisGroupCountry	StaffName
►	Korea	Heath Ledger
	Hong Kong	Jessica Chastain

Task 8 (5 marks):

Write a query to display the name of package tours along with their component tours. Include only packages that consist of more than two component tours. The column names should indicate whether each entry is a package or a component.

Expected Output:

	PackageTourName	ComponentTourName
►	Premium Tour Package	Hiking and Biking
	Premium Tour Package	Safari
	Premium Tour Package	Shark Diving

Level-Three

This level has two questions.

Task 9 (5 marks):

Write a query to display the ID, name, and cost of all package tours. Include a column that shows the total cost of all the component tours within each package and another column that calculates the savings provided by the package tour. Ensure that all prices are prefixed with '\$'. *Note: The query should only include records for package tours.*

Expected Output:

	TourID	TourName	TourCost	TotalComponentCo...	Savings
►	T1	Premium Tour Package	\$500.00	\$650.00	\$150.00
	T2	Standard Tour Package	\$420.00	\$450.00	\$30.00

Task 10 (5 marks):

Write a query to display the name of the reserve and its partnering organization, the duration of the partnership in years, and the amount funded. Include only records where the first digit in the organization contact number is '9' (excluding the area code), the amount funded exceeds the average funding across all organizations, and the reserve has no package tours booked. The funded amount should be prefixed with "\$".

Expected Output:

	ReserveName	OrganisationName	Partnership Duration	Amount
►	Caledon Nature Reserve	BlueEyes Corp	2.0986	\$1632025.00
	Caledon Nature Reserve	Songbird Supreme	5.5452	\$1420420.00

How will the Viva Assessment work?

- To assess your understanding of your submitted work, we will be conducting a viva assessment in Week 11 in your enrolled SGTAs/Workshops.
- You will be given a total score of zero for Assignment 2 if you do not attend your viva assessment. The students with late submissions will only be graded in Week-13 workshop.
- You will need to know how to *open MySQLWorkbench & create a connection to AshServer in the lab computer, run your codes to produce an output, and create a new SQLFile from scratch to check the execution/comment as needed.*
- You will be asked to download your Assignment submission and you can use this as a reference during the exam to answer the questions. All the questions will be based on the tables created in Level One.
- You will be provided with a set of questions - 5 questions and an expected output; You can write your codes, run them, check the output and submit your answers. You will have 15 minutes for this and your SGTA teaching staff might ask you questions and grade you.
- You will be under examination conditions and this means communicating with any other student in any method or form will be a breach of academic integrity.