Assignment 3B Handout
- Normalisation and Database Management with SQL -
Semester 1, 2021

Due date: 4th June 2021, Friday (11:59pm)
Weight: 30%

Assignment Declaration

By submitting this assignment, I am/We are aware of the University rule that a student must not act in a manner which constitutes academic dishonesty as stated and explained in the QUT Manual of Policies and Procedures. I/We confirm that this work represents my individual/our team's effort. I/we have viewed the final version and declare that it does not contain plagiarized material.

Full Name	Student No.

Note
If you are working in a group, only one group member is required to submit the assessment.

How to Submit Your Assessment?

You must submit 4 files in a ZIP file using the submission link in Blackboard:

1. SQL script (a text file with the file extension changed to sql) containing your solution to task 1.
2. SQL script containing your solutions for tasks 2 and 3 (do not upload the database import script as part of your solution).
3. Word or PDF containing your solution to task 4 and 5.
4. **README.txt containing your full name, student number (and the name and student number of your partner if working in pairs) and a list of any queries you have attempted but were not able to successfully run in Workbench.**

If you do not follow these submission guidelines you will lose up to 3 marks. Scripts in different file types will not be accepted.

Task 1 [20% = 6 marks] Interactive Voting Form Database

Write an SQL script to create a database to match the Rmap provided below. ***Your script MUST execute in MySQL Workbench without errors to receive full marks. You can ensure that by executing your commands in correct order as well as avoiding use of non-MySQL functions such as CHECK.***

Marks will be awarded for the following:

1. Creating the database (1 mark)
2. Successfully creating new tables (1 mark)
3. Including all attributes (1 mark)
4. Including constraints (1 mark)
5. Correctly creating Primary Keys (1 mark)
6. Correctly creating Foreign Keys (1 mark)

File(Filename, Foldername, [size], MemberNr);

Member(MemberNr, Fullname, Address, Password);

Voting(MemberNr, MotionNr, Option {Yes, No});

Motion(MotionNr, MotionText);

Task 2 [45% = 13.5 marks] using the Treasure Hunter's database

For task 2, we have provided you with the creation script for the Treasure Hunter's database. You should run this script in MySQL Workbench and use this database to extract the necessary information.

The script is based on the following schematic:

TREASURE HUNTER'S RELATIONAL MODEL

Player (username, firstName, lastName, gender, DOB, email, streetNo, streetName, suburb, state, postcode, creationDateTime, totalPoints)

PhoneNumber (phoneNumber, username)

Treasure (treasureID, description, points, webpage, type, questID)

Quest (questID, questName, story, beacon, advancedQuestID)

Store (storeID, storeName, openTime, closeTime)

Badge (badgeID, badgeName, badgeDescription)

PlayerProgress (questID, username, progress)

PlayerTreasure (username, treasureID)

Purchase (purchaseID, storeID, username, badgeID, purchaseDateTime, cost)

FOREIGN KEYS

- PhoneNumber (username) is dependent on Player(username)
- Quest (advancedQuestID) is dependent on Quest(questID)
- Treasure (questID) is dependent on Quest (questID)
- PlayerProgress (questID) is dependent on Quest (questID)
- PlayerProgress (username) is dependent on Player (username)
- PlayerTreasure (username) is dependent on Player (username)
- PlayerTreasure (treasureID) is dependent on Treasure (treasureID)
- Purchase (storeID) is dependent on Store (storeID)
- Purchase (username) is dependent on Player (username)
- Purchase (badgeID) is dependent on Badge (badgeID)

OTHER CONSTRAINTS

- Player (gender) must be female, male, other or prefer not to disclose.
- Player (state) domain is [QLD, SA, TAS, NSW, WA, NT or ACT].
- Treasure (type) domain is [common, uncommon, rare, ultra-rare or elite].
- Players may enter up to three phone numbers.
- Players must enter at least one phone number.
- PlayerProgress (progress) domain is [active, inactive or complete].
- Player (email) is mandatory.

Query 1 (1 mark)

Write a query to list the name (first and last), date of birth, gender and email of players who live in Sunnybank or Sunnybank Hills. Note that you can assume these are the only suburbs starting with ‘Sunnybank’.

Query 2 (2 mark)
Write a query to find out how much each player has spent across all stores. Your output should be sorted by username in descending order.

Query 3 (2 marks)
Write a query that lists the username and phone number(s) of the oldest player. Note that you must use subqueries for this query.

Query 4 (3 marks)

Write a query that lists all of the badges. If the badge has been purchased include the first name, last name and email address of the player(s) who have purchased said badge. Sort the list based on the badge name followed by first name then last name in ascending order.

Query 5 (3 marks)

List the number of quests embarked upon by each player with progress status ‘complete’ for the treasures that are of the type 'common'.

Create Index (1 mark)
Currently the database only contains a small number of records, however the data contained within it is expected to grow significantly in the future. Creating indexes on commonly searched columns is a way performance issues can be minimized.

Write a command to create an index on webpage of the treasure table.

Create view (1.5 marks)
Write a command to create a view to list the firstname, lastname and account creation date of any players that haven't completed any quests.

Task 3 [15% = 4.5 marks]

Insert (1.5 marks)
Write an INSERT command to insert a row into badge table. The badge is called 'Fools Gold' and the description should be 'Trickiest trickster in all the seas'.

Delete (1.5 marks)
Write a DELETE command to remove all the rows from the player progress table for which progress is inactive.

Update (1.5 marks)
Write an UPDATE comment to change the address of all players with the last name 'Smith' who live at '180 Zelda Street, Linkburb' to '72 Evergreen Terrace, Springfield'.

Task 4 [15% = 4.5 marks] Normalisation

Using the following INVOICE table structure, identify all functional dependences and decompose this table into a set of 3NF relations.

INV_ NUM	PROD_ NUM	SALE_ DATE	PROD_ DESCRIPTION	VEND_ CODE	VEND_ NAME	NUMBER_ SOLD	PROD_ PRICE
211347	AA-E342	15-JAN-21	Rotary Sander	211	NF, Inc.	1	$49.95
211347	QD-30093	15-JAN-21	0.25-in. drill bit	211	NF, Inc.	8	$3.45
211347	RU-99574	15-JAN-21	Band Saw	309	BGood, Inc.	1	$39.99
211348	AA-E342	15-JAN-21	Rotary Sander	211	NF, Inc.	2	$49.95
211349	GH-77834	16-JAN-21	Power Drill	157	TGo, Inc.	1	$87.75

Assumptions
1. There are no multivalued dependencies.
2. Any invoice numbers may reference more than one product.
3. Any given product is supplied by a single vendor, but a vendor can supply many products.

Task 5 [5% = 1.5 marks] Analysis of Client Brief

Write your answers on the following topics using between 300 - 500 words in total.

1. Explain the role of databases in your organisation.
2. Define security and privacy. How are the two concepts related?