COMP3278 Introduction to Database Management Systems
Assignment 2
Programming assignment SQL & Application development

Due date: 18 March 17:30

The database schema solution developed in Assignment 1 has been adopted by the V-Chat company with some modifications. The schemas are shown below (The underlined attributes represent the primary key of the relation):

1. **User** (userID:INT(12), username:VARCHAR(64), accountBalance:DOUBLE)
   Foreign key: None

2. **Frient** (User1 userID:INT(12), User2 userID:INT(12), date:DATE)
   Foreign keys: User1_userID referencing User(userID);
   User2_userID referencing User(userID)

3. **Vgroup** (groupID:INT(12), groupName:VARCHAR(64))
   Foreign key: None

4. **Member_in_group** (userID:INT(12), groupID:INT(12), role:
   ENUM('group_creater', 'administrator', 'member'))
   Foreign keys: userID referencing User(userID);
   groupID referencing Vgroup(groupID)

5. **Merchant** (merchantID:INT(12), merchantName:VARCHAR(64))
   Foreign keys: None

6. **Mobilespot** (merchantID:INT(12), spotID:INT(12), location:TEXT)
   Foreign keys: merchantID referencing Merchant(merchantID)

7. **Transaction** (transactionID:INT(12), date:DATE, amount:DOUBLE,
   make_userID:INT(12))
   Foreign keys: make_userID referencing User(userID)

8. **P2Ptransfer** (transactionID:INT(12), transferTo_userID:INT(12))
   Foreign keys: transactionID referencing Transaction(transactionID);
   transferTo_userID referencing User(userID)

9. **Payment** (transactionID:INT(12), merchantID:INT(12), spotID:INT(12))
   Foreign keys: transactionID referencing Transaction(transactionID);
   merchantID, spotID referencing Mobilespot(merchantID,
   spotID)

Requirements

1) [20%] **Build the database using MySQL**.
   a. Using the schemas above, define tables with appropriate **constraints**.
   b. Store the corresponding table definition commands in a sql file called "tables.sql" (Please include also the building of referential constraints in the .sql file, make sure that the files can correctly build the necessary tables and constraints when import to another database).

2) [80%] **Answer queries and display results**.

- Please build **q1.php** to **q9.php**, which solve the following 9 queries, and display the result in a web browser.
- Please note that besides the 9 php files, you have to include one more file **q6_submit.php**, we will explain the use of q6_submit.php later.
- Please browse to the following page for the expected output of the php files with the given sample data.
  https://i.cs.hku.hk/~xxlong/A2_solutions/index.html

Q1. [**Given sample**] Display the `userID, userName` and `accountBalance` of the user with `userID` equal to 1.

Q2. [5%] Display the `transactionID`, `date`, `amount` , and the `username` of the recipient(s) of all P2Ptransfers made after 2018-05-01. Sort the selected records such that the newer P2Ptransfers are listed ahead of the older P2Ptransfers.

Q3. [5%] Display the `merchantID` and `merchantName` of the merchants(s), whose name contain the suffix "store". Sort the merchants in ascending order of merchantID.

Q4. [10%] Consider the payment transaction(s) that are made by the user with userID equals to 1. Display the `merchantID`, `merchantName` , and `cost` of the merchant(s) that receives two or more payment transactions from the user (with userID 1), where `cost` is the sum of the amounts of the payment transactions made by the user (with userID 1) to that merchant. Sort the records in ascending order of merchantID.

Q5. [5%] For the transaction(s) with amount more than $10 made by the user named "tom", display the `transactionID`, `date` and `amount`. Sort the transactions in descending order of date, and then in ascending order of amount.

Q6. [15%] Display a drop-down menu which contains the `groupID` and `groupName` of all the groups.

- Please create q6.php as well as q6_submit.php.
- In q6_submit.php: Consist of a submit button and a drop-down menu with options as "Group ID: Group name" for all the group, in ascending order of groupID. The options should be dynamically generated according to the groups stored in the database.
- After you click the submit button, the page will be directed from q6_submit.php to q6.php.
- In q6.php: Display the `userID` and `username` of all the users(s) in the selected group.

Q7. [15%] Update q6.php by making the name of the user (say, with `userID` as `x`) as a hyperlink to `q7.php?userID=x`.

- In q7.php, display the `transactionID`, `date` and `amount` of the transaction(s) made by user `x` in descending order of date.
- For P2Ptransfer transaction, display in the last column the name of the user `y` receiving the transfer. Make the name of the user `y` as a hyperlink to `q7.php?userID=y`
- For Payment transaction, display in the last column the concatenation of `merchantName` and `location` (delimited by a space) of the mobile spot receiving the payment.

Q8. [15%] Display all merchants q8.php. For each merchant, display:

- The `merchantID` and `merchantName`, `numberOfSpots` and `totalRevenues` of this merchant, where totalRevenues is the sum of all payment transactions received by that merchant.

Q9. [10%] Update q8.php by making the `merchantName` of each merchant as a hyperlink to `q9.php?merchantID=x`

- In q9.php: There are two tables. One table displays the `spotID`, `revenue`, and `location` of all mobileSpots of that merchant, where `revenue` is the sum of the amount of payment transactions made to the mobileSpot, in descending order of spotID.
- Another table displays the `transactionID`, `spotID`, `date` and `amount` of payments to this merchant.

Hand in

1. Please compress "tables.sql", and the 10 related PHP files into one zip file and use your student number to name it (e.g. 303004954x.zip).
2. Please submit this zip file through our Moodle system before the deadline.

Important Notes

1. Let's enjoy this assignment as an interesting SQL practice ☺.
2. Table names and attribute names must be **consistent** with the names provided in relation schemas.
3. Tutorials 2 and 3 contain important information about how to install and use PHP and MySQL. Please refer to these tutorials if necessary.
4. We provided sample tuples and sample query results for you to verify the correctness of your table definitions. Please do not submit the files with the sample data.
5. The data that we use to grade your assignment may be different from the sample data.
6. Please feel free to post your questions on Moodle forum, or contact us (TA Xiaoxiao xxlong@connect.hku.hk) if you encounter any difficulty in this assignment. We are very happy to help.

We wish you enjoy learning database technologies in this course ☺