Project 2: SQL Query

INSTRUCTIONS

1. This project is an individual project.
2. Submit the "`project2-[studentid].zip`" ZIP file (for example: "`project2-A012345L.zip`") containing the completed python file "`project2.py`" to the "`Project 2 Submissions`" folder in IVLE Workbin (Files) "`Projects/Project 2`" by **Friday 21 September, 17:00**.
3. Do not submit the Python file outside a zip and follows the naming rules!
4. Past this deadline and before **Friday 28 September, 17:00**, you may submit to the "`Project 2 Late Submissions`" folder (penalties apply).

In this project, we use Python 2 or Python 3 with the SQLAlchemy library to connect to and interact with an PostgreSQL database.

We interact with the database using the direct execution of SQL commands as strings.

- Download the file "`project2.zip`" from the IVLE Workbin (Files) "`Projects/Project 2`" folder.
- Extract the SQL files "`customers.sql`", "`credit_cards.sql`", "`merchands.sql`", and "`transactions.sql`".
- Extract the Python file "`project2.py`".

Create a PostgreSQL database called "`bt5110`" if you have not done so already. Otherwise, drop the "`transactions`" table from the "`bt5110`" database (Go to pgAdmin query tool and run `DROP TABLE transactions;`). You might also need to drop the `customers`, `games` and `downloads` tables if you have tried the examples on the lecture notes. Create and populate in the database "`bt5110`" the four tables: `customers`, `credit_cards`, `merchands` and `transactions` using the corresponding SQL files.

Modify the Python file "`project2.py`" by writing the ten SQL queries in the space indicated. The ten SQL queries that you are asked to write are to translate the following ten queries in English.

Question 1 [9 marks]

(a) Find the first and last names of the customers in Singapore who own a visa credit card.

(b) For each customer, find how many credit cards he or she owns. Print the customer's social security number and the number of credit cards owned.

(c) For each Singaporean customer, find his or her first and last names and his or her total expenditure.

(d) Find the social security numbers, first and last names of the different customers who purchased something from a merchand in a different country than the customer's country.

(e) Find the social security number of the different visa owners who purchased something on Christmas day.

(f) Find for each type of credit card the most expensive transactions. Print the credit card type and the amount of the transaction.

Question 2 [6 marks]

The next four questions are challenging, not everybody may be able to answer them correctly.

(a) Print the transaction identifier of the transactions that have the most expensive amount among all transactions using a credit card of the same type. Use aggregate queries (Hint: use the query in Question 1f).

(b) Print the transaction identifier of the transactions that have the most expensive amount among all transactions using a credit card of the same type. Same question as in Question 2a but do not use aggregate queries.

(c) Find the code and name of the different merchands who did not entertain transactions for every type of credit card. Use aggregate queries.

(d) Find the code and name of the different merchands who did not entertain transactions for every type of credit card. Same question as in Question 2c but do not use aggregate queries.

In the Python file "`project2.py`", for each query you find a corresponding variable assigned to a placeholder query. For instance, for the query of Question 1e, you find the variable `q1e = ''SELECT c.ssn FROM customers c, credit_cards cc, merchands m, transactions t LIMIT 1;''`. The Python program writes the results of the ten queries `q1a` to `q2d` in ten CSV files called `q1a.csv` to `q2d.csv`, respectively. Do not submit the CSV files.

For each question, replace the place holder query with your answer.

Submit the revised Python file "`project2.py`" in a ZIP file called "`project2-[studentid].zip`" (for example: "`project2-A012345L.zip`"). Do not forget to change your student ID in the code. Do not submit the SQL and CSV files.

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