Tarea S4. Jianji Chen

Nivell 1

Exercici 1

Descàrrega els arxius CSV, estudia'ls i dissenya una base de dades amb un esquema d'estrella que contingui, almenys 4 taules de les quals puguis realitzar les següents consultes requisites:

(1) crear un esquema “tarea_s4” y 4 tablas, e introducir datos

```
4 •  CREATE DATABASE tarea_s4;
5 •  USE tarea_s4;
```

```
15 •  CREATE TABLE credit_cards(
16        card_id VARCHAR(20) PRIMARY KEY,
17        user_id INT REFERENCES users(id),
18        iban VARCHAR(50),
19        pan VARCHAR(50),
20        pin VARCHAR(4),
21        cvv INT,
22        track1 VARCHAR(255),
23        track2 VARCHAR(255),
24        expiring_date VARCHAR(20));
```

```
26 •  CREATE TABLE users(
27        user_id INT PRIMARY KEY,
28        name VARCHAR(100),
29        surname VARCHAR(100),
30        phone VARCHAR(150),
31        email VARCHAR(150),
32        birth_date VARCHAR(100),
33        country VARCHAR(150),
34        city VARCHAR(150),
35        postal_code VARCHAR(100),
36        address VARCHAR(255));
```

```sql
CREATE TABLE transactions(
    transaction_id VARCHAR(255) PRIMARY KEY,
    card_id VARCHAR(15) REFERENCES credit_cards(id),
    company_id VARCHAR(20) REFERENCES companies(company_id),
    timestamp TIMESTAMP,
    amount DECIMAL(10, 2),
    declined BOOLEAN,
    product_ids VARCHAR(255),
    user_id INT REFERENCES users(id),
    lat FLOAT,
    longitude FLOAT,
    FOREIGN KEY (company_id) REFERENCES companies(company_id),
    FOREIGN KEY (card_id) REFERENCES credit_cards(card_id),
    FOREIGN KEY (user_id) REFERENCES users(user_id));
```

```sql
LOAD DATA LOCAL INFILE
"C:\\EEE\\IT Academy_Analisis de Dades\\Especialitazacio_DA\\Tasca S4.01. Creacio de Base de Dades\\companies.csv"
INTO TABLE companies
CHARACTER SET 'UTF8MB4'
FIELDS TERMINATED BY ','
ENCLOSED BY '"'
LINES TERMINATED BY '\r\n'
IGNORE 1 LINES;
```

```sql
LOAD DATA LOCAL INFILE
"C:\\EEE\\IT Academy_Analisis de Dades\\Especialitazacio_DA\\Tasca S4.01. Creacio de Base de Dades\\credit_cards.csv"
INTO TABLE credit_cards
CHARACTER SET 'UTF8MB4'
FIELDS TERMINATED BY ','
ENCLOSED BY '"'
LINES TERMINATED BY '\n'
IGNORE 1 LINES;
```

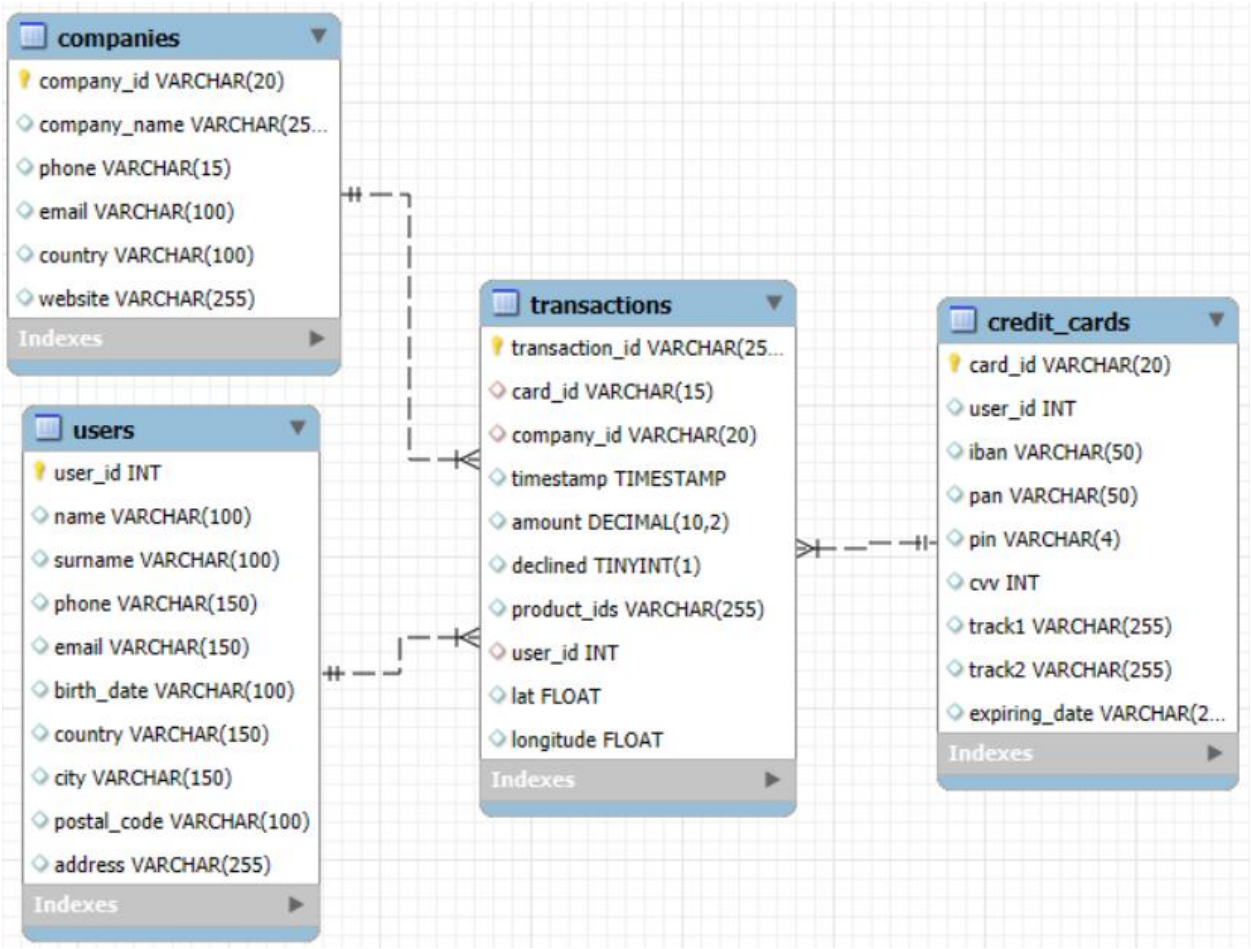
```sql
LOAD DATA LOCAL INFILE
"C:\\EEE\\IT Academy_Analisis de Dades\\Especialitazacio_DA\\Tasca S4.01. Creacio de Base de Dades\\users_ca.csv"
INTO TABLE users
CHARACTER SET 'UTF8MB4'
FIELDS TERMINATED BY ','
ENCLOSED BY '"'
LINES TERMINATED BY '\r\n'
IGNORE 1 LINES;
```

```sql
LOAD DATA LOCAL INFILE
"C:\\EEE\\IT Academy_Analisis de Dades\\Especialitazacio_DA\\Tasca S4.01. Creacio de Base de Dades\\users_uk.csv"
INTO TABLE users
CHARACTER SET 'UTF8MB4'
FIELDS TERMINATED BY ','
ENCLOSED BY '"'
LINES TERMINATED BY '\r\n'
IGNORE 1 LINES;
```

```
89 •  LOAD DATA LOCAL INFILE
90    "C:\\EEE\\IT Academy_Analisis de Dades\\Especialitazacio_DA\\Tasca S4.01. Creacio de Base de Dades\\users_usa.csv"
91    INTO TABLE users
92    CHARACTER SET 'UTF8MB4'
93    FIELDS TERMINATED BY ','
94    ENCLOSED BY '"'
95    LINES TERMINATED BY '\r\n'
96    IGNORE 1 LINES;

98 •  LOAD DATA LOCAL INFILE
99    "C:\\EEE\\IT Academy_Analisis de Dades\\Especialitazacio_DA\\Tasca S4.01. Creacio de Base de Dades\\transactions.csv"
100   INTO TABLE transactions
101   CHARACTER SET 'UTF8MB4'
102   FIELDS TERMINATED BY ';'
103   ENCLOSED BY '"'
104   LINES TERMINATED BY '\r\n'
105   IGNORE 1 LINES;
```

(2) crear un diagrama de modelo de estrella de las 4 tablas



Exercici 1

Realitza una subconsulta que mostri tots els usuaris amb més de 30 transaccions utilitzant almenys 2 taules.

```
109 •   SELECT u.*
110     FROM users u
111     INNER JOIN transactions t
112     ON u.user_id = t.user_id
113     GROUP BY u.user_id
114     HAVING COUNT(t.transaction_id) > 30;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

user_id	name	surname	phone	email	birth_date	country	city	postal_code
92	Lynn	Riddle	1-387-885-4057	vitae.aliquet@outlook.edu	Sep 21, 1984	United States	Bozeman	61871
267	Ocean	Nelson	079-481-2745	aenean@yahoo.com	Dec 26, 1991	Canada	Charlottetown	85X 3P4
272	Hedwig	Gilbert	064-204-8788	sem.eget@icloud.edu	Apr 16, 1991	Canada	Tuktoyaktuk	Q4C 3G7
275	Kenyon	Hartman	082-871-7248	convallis.ante.lectus@yahoo.com	Aug 3, 1982	Canada	Richmond	R8H 2K2

Exercici 2

Mostra la mitjana d'amount per IBAN de les targetes de crèdit a la companyia Donec Ltd, utilitza almenys 2 taules.

```
119 •   SELECT c.company_name, cc.iban, AVG(t.amount) AS mean_sale
120     FROM transactions t
121     INNER JOIN credit_cards cc
122     ON t.card_id = cc.card_id
123     INNER JOIN companies c
124     ON t.company_id = c.company_id
125     WHERE c.company_name = "Donec Ltd"
126     GROUP BY c.company_name, cc.iban;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

company_name	iban	mean_sale
Donec Ltd	PT87806228135092429456346	203.715000

Nivell 2

Exercici 1

Crea una nova taula que reflecteixi l'estat de les targetes de crèdit basat en si les últimes tres transaccions van ser declinades i genera la següent consulta: Quantes targetes estan actives?

(1) Crear la tabla

```sql
CREATE TABLE card_status
SELECT
    CONCAT(tt.transaction_id, "_", tt.card_id) AS transaction_card_id,
    tt.transaction_id, tt.card_id,
    STR_TO_DATE(cc.expiring_date, '%m/%d/%Y') AS expiring_date,
    tt.timestamp, tt.declined
FROM credit_cards cc
JOIN (
    SELECT *,
        ROW_NUMBER() OVER (PARTITION BY card_id ORDER BY timestamp DESC) AS rn
    FROM transactions) tt
ON cc.card_id = tt.card_id
WHERE tt.rn <= 3;

ALTER TABLE card_status
    MODIFY transaction_card_id VARCHAR(255) PRIMARY KEY,
    ADD FOREIGN KEY (card_id) REFERENCES credit_cards(card_id);
SELECT * FROM card_status;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

transaction_card_id	transaction_id	card_id	expiring_date	timestamp	dec
063FBA79-99EC-66FB-29F7-25726D1764A5_Cc...	063FBA79-99EC-66FB-29F7-25726D1764A5	CcU-2987	2023-10-31	2022-01-06 21:25:27	0
0668296C-CDB9-A883-76BC-2E4C44F8C8AE_C...	0668296C-CDB9-A883-76BC-2E4C44F8C8AE	CcU-3743	2022-06-11	2022-01-26 02:07:14	0
07A46D48-31A3-7E87-65B9-0DA902AD109F_C...	07A46D48-31A3-7E87-65B9-0DA902AD109F	CcU-3225	2022-12-20	2021-06-28 21:11:42	1
09DE92CE-6F27-2BB7-13B5-9385B2B3B8E2_Cc...	09DE92CE-6F27-2BB7-13B5-9385B2B3B8E2	CcU-3071	2023-12-20	2021-05-11 20:40:06	1

(2) Consulta: cantidad de tarjetas activas actualmente

```sql
SELECT COUNT(DISTINCT card_id) AS num_card_active
FROM card_status
WHERE expiring_date > NOW();
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

num_card_active
32

Nivell 3

Exercici 1

Crea una taula amb la qual puguem unir les dades del nou arxiu products.csv amb la base de dades creada, tenint en compte que des de transaction tens product_ids. Genera la següent consulta: el nombre de vegades que s'ha venut cada producte.

(1) crear la tabla "products" e introducir los datos

```sql
CREATE TABLE products(
    product_id INT PRIMARY KEY,
    product_name VARCHAR(100),
    price VARCHAR(20),
    colour VARCHAR(20),
    weight DECIMAL(10, 1),
    warehouse_id VARCHAR(20));

LOAD DATA LOCAL INFILE
"C:\\EEE\\IT Academy_Analisis de Dades\\Especialitazacio_DA\\Tasca S4.01. Creacio de Base de Dades\\products.csv"
INTO TABLE products
CHARACTER SET 'UTF8MB4'
FIELDS TERMINATED BY ','
ENCLOSED BY '"'
LINES TERMINATED BY '\n'
IGNORE 1 LINES;

UPDATE products
SET price = REPLACE(price, "$", "")
WHERE product_id <> "";

ALTER TABLE products
MODIFY price DECIMAL(10, 2);

SELECT * FROM products;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

product_id	product_name	price	colour	weight	warehouse_id
1	Direwolf Stannis	161.11	#7c7c7c	1.0	WH-4
2	Tarly Stark	9.24	#919191	2.0	WH-3
3	duel tourney Lannister	171.13	#d8d8d8	1.5	WH-2

(2) encontrar la cantidad máxima de productos por transacción

```sql
SELECT SUM(LENGTH(product_ids) - LENGTH(REPLACE(product_ids, ",", "")) + 1) AS num_product
FROM transactions
GROUP BY transaction_id
ORDER BY num_product DESC
LIMIT 1;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch rows:

num_product
4

(3) crear una tabla “numbers” de numeros de 1 hasta 10 (ser flexible), más que la cantidad maxima de productos por transaction, para separar product_ids en la tabla transactions

```sql
CREATE TABLE numbers(
  n int);
INSERT INTO numbers VALUES (1),(2),(3),(4),(5),(6),(7),(8),(9),(10);
```

(4) separar product_ids y crear una nueva tabla.

```
205 •  CREATE TABLE transactions_products
206    SELECT
207        CONCAT(t.transaction_id, "_",
208            SUBSTRING_INDEX(SUBSTRING_INDEX(t.product_ids, ", ", n.n), ", ", -1))
209            AS transaction_product_id,
210        transaction_id,
211        SUBSTRING_INDEX(SUBSTRING_INDEX(t.product_ids, ", ", n.n), ", ", -1) AS product_id
212    FROM transactions t
213    INNER JOIN numbers n
214    ON n.n <= LENGTH(t.product_ids) - LENGTH(REPLACE(t.product_ids, ",", "")) + 1;
215
216 •  ALTER TABLE transactions_products
217        ADD PRIMARY KEY(transaction_product_id),
218        ADD FOREIGN KEY (transaction_id) REFERENCES transactions(transaction_id),
219        MODIFY product_id INT,
220        ADD FOREIGN KEY (product_id) REFERENCES products(product_id);
221
222 •  SELECT * FROM transactions_products;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content: | Fetch rows:

transaction_product_id	transaction_id	product_id
02C6201E-D90A-1859-B4EE-88D2986D3B02_1	02C6201E-D90A-1859-B4EE-88D2986D3B02	1
02C6201E-D90A-1859-B4EE-88D2986D3B02_19	02C6201E-D90A-1859-B4EE-88D2986D3B02	19
02C6201E-D90A-1859-B4EE-88D2986D3B02_71	02C6201E-D90A-1859-B4EE-88D2986D3B02	71
0466A42E-47CF-8D24-FD01-C0B689713128_43	0466A42E-47CF-8D24-FD01-C0B689713128	43
0466A42E-47CF-8D24-FD01-C0B689713128_47	0466A42E-47CF-8D24-FD01-C0B689713128	47

(5) consulta: el número de veces que se ha vendido cada producto.

```
225 •  SELECT tp.product_id, p.product_name, COUNT(DISTINCT tp.transaction_id) AS num_transactions
226    FROM transactions t
227    JOIN transactions_products tp
228    ON t.transaction_id = tp.transaction_id
229    JOIN products p
230    ON tp.product_id = p.product_id
231    WHERE t.declined = 0
232    GROUP BY tp.product_id
233    ORDER BY num_transactions DESC;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

product_id	product_name	num_transactions
23	riverlands north	60
67	Winterfell	59
2	Tarly Stark	56

Mostrar el modelo final de tablas