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

```sql
CREATE DATABASE tarea_s4;
USE tarea_s4;

CREATE TABLE companies(
    company_id VARCHAR(20) PRIMARY KEY,
    company_name VARCHAR(255),
    phone VARCHAR(15),
    email VARCHAR(100),
    country VARCHAR(100),
    website VARCHAR(255));

CREATE TABLE credit_cards(
    id VARCHAR(20) PRIMARY KEY,
    user_id INT REFERENCES users(id),
    iban VARCHAR(50),
    pan VARCHAR(50),
    pin VARCHAR(4),
    cvv INT,
    track1 VARCHAR(255),
    track2 VARCHAR(255),
    expiring_date VARCHAR(20));

CREATE TABLE users(
    id INT PRIMARY KEY,
    name VARCHAR(100),
    surname VARCHAR(100),
    phone VARCHAR(150),
    email VARCHAR(150),
    birth_date VARCHAR(100),
    country VARCHAR(150),
    city VARCHAR(150),
    postal_code VARCHAR(100),
    address VARCHAR(255));
```

```sql
CREATE TABLE transactions(
    id VARCHAR(255) PRIMARY KEY,
    card_id VARCHAR(15) REFERENCES credit_cards(id),
    business_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 (business_id) REFERENCES companies(company_id),
    FOREIGN KEY (card_id) REFERENCES credit_cards(id),
    FOREIGN KEY (user_id) REFERENCES users(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;
```

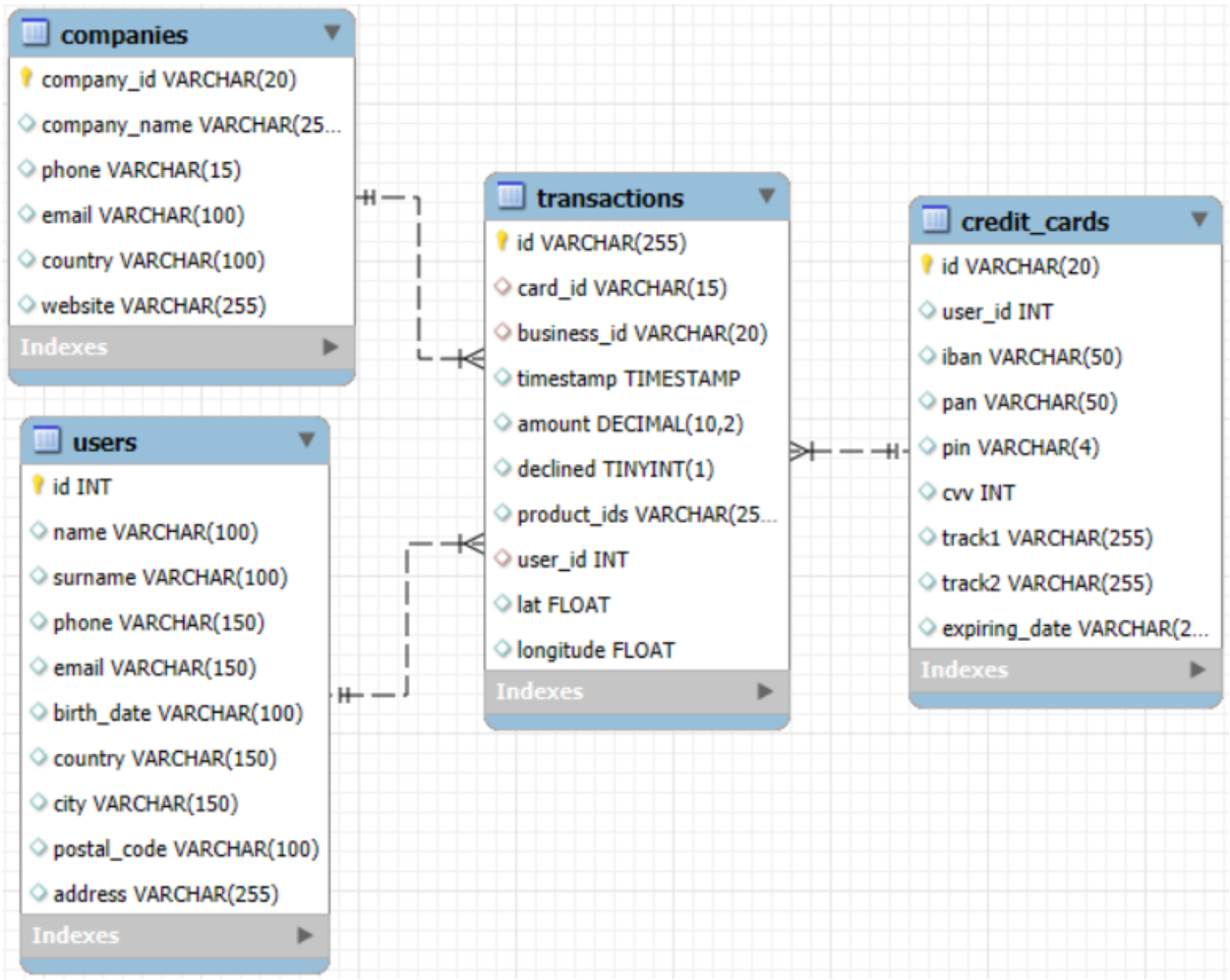
```sql
LOAD DATA LOCAL INFILE
"C:\\EEE\\IT Academy_Analisis de Dades\\Especialitazacio_DA\\Tasca S4.01. Creacio de Base de Dades\\users_ca.csv"
INTO TABLE users
CHARACTER SET 'UTF8MB4'
FIELDS TERMINATED BY ','
ENCLOSED BY '"'
LINES TERMINATED BY '\r\n'
IGNORE 1 LINES;
```

```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.id = t.user_id
113    GROUP BY u.id
114    HAVING COUNT(t.id) > 30;
```

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

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

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.id
123    INNER JOIN companies c
124    ON t.business_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

```
134 •  CREATE TABLE card_status
135    SELECT tt.card_id,
136        STR_TO_DATE(cc.expiring_date, '%m/%d/%Y') AS expiring_date,
137        tt.id AS transaction_id,
138        tt.timestamp, tt.declined
139    FROM credit_cards cc
140    JOIN (
141        SELECT *,
142            ROW_NUMBER() OVER (PARTITION BY card_id ORDER BY timestamp DESC) AS rn
143        FROM transactions) tt
144    ON cc.id = tt.card_id
145    WHERE tt.rn <= 3;
146 •  SELECT * FROM card status;
```

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

card_id	expiring_date	transaction_id	timestamp	declined
CcU-2938	2022-10-30	AD85A78A-8829-5746-93A0-8B7A792EBC18	2022-03-12 09:23:10	0
CcU-2938	2022-10-30	F1A598A2-86C5-50A9-F1CE-FB1D69866C39	2022-03-09 20:53:59	0
CcU-2938	2022-10-30	55166D02-D74C-6A63-6C54-867846764984	2022-02-24 11:01:42	0
CcU-2945	2023-08-24	7DC26247-20EC-53FE-E555-B6C2E55CA5D5	2022-02-04 15:52:56	0
CcU-2945	2023-08-24	FE96CE47-BD59-381C-4E18-E3CA3D44E8FF	2021-06-15 00:26:29	1
CcU-2952	2021-06-29	72997E96-DC2C-A4D7-7C24-66C302F8AE5A	2022-01-30 15:16:36	0

(2) Consulta: cantidad de tarjetas activas actualmente

```
148 •  SELECT COUNT(DISTINCT card_id) AS num_card_active
149    FROM card_status
150    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(
    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;
```

```sql
UPDATE products
SET price = REPLACE(price, "$", "")
WHERE id <> "";

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

SELECT * FROM products;
```

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

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 id
ORDER BY num_product DESC
LIMIT 1;
```

(3) crear una tabla “numbers” de numeros de 1 hasta 4, la cantidad maxima de productos por transaction, para separar product_ids en la tabla transactions

```
194 • CREATE TABLE numbers(
195       n int);
196 •  INSERT INTO numbers VALUES (1),(2),(3),(4);
```

(4) separar product_ids y crear una nueva tabla.

```
199 • CREATE TABLE transactions_products
200   SELECT
201       id AS transaction_id,
202       SUBSTRING_INDEX(SUBSTRING_INDEX(t.product_ids, ", ", n.n), ", ", -1) product_id
203   FROM transactions t
204   INNER JOIN numbers n
205   ON n.n <= LENGTH(t.product_ids) - LENGTH(REPLACE(t.product_ids, ",", "")) + 1;
206
207 • ALTER TABLE transactions_products
208       MODIFY product_id INT,
209       ADD FOREIGN KEY (transaction_id) REFERENCES transactions(id),
210       ADD FOREIGN KEY (product_id) REFERENCES products(id);
211
212 • SELECT * FROM transactions products;
```

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

transaction_id	product_id
02C6201E-D90A-1859-B4EE-88D2986D3B02	19
02C6201E-D90A-1859-B4EE-88D2986D3B02	1
02C6201E-D90A-1859-B4EE-88D2986D3B02	71

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

```
215 • SELECT tp.product_id, p.product_name, COUNT(DISTINCT tp.transaction_id) AS num_transactions
216   FROM transactions t
217   JOIN transactions_products tp
218   ON t.id = tp.product_id
219   JOIN products p
220   ON tp.product_id = p.id
221   WHERE t.declined = 0
222   GROUP BY tp.product_id
223   ORDER BY num transactions DESC;
```

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

product_id	product_name	num_transactions
23	riverlands north	68
79	Direwolf riverlands the	66
2	Tarly Stark	65

Mostrar el modelo final de tablas