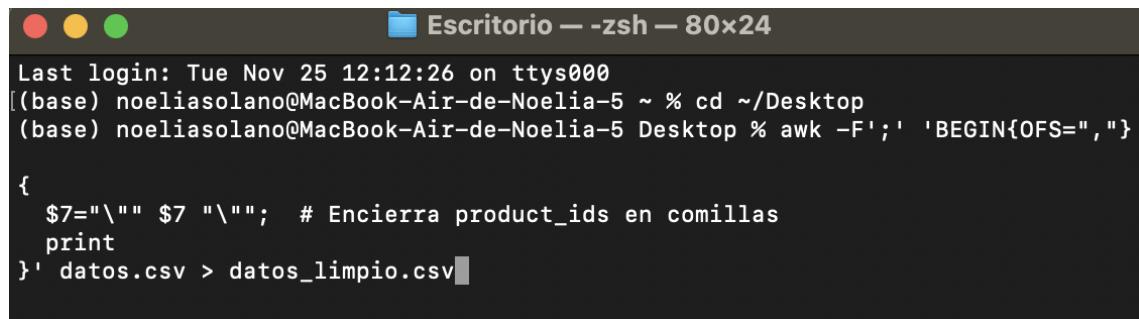


SPRINT 4

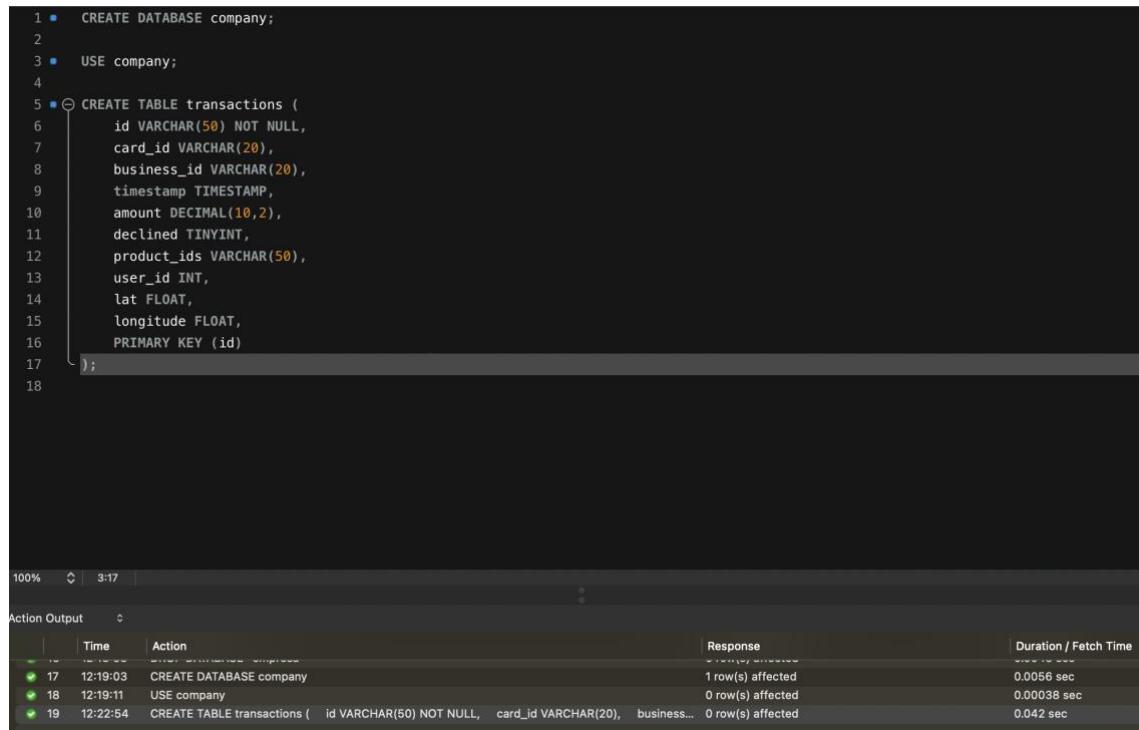
NIVELL 1

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:



```
Last login: Tue Nov 25 12:12:26 on ttys000
(base) noeliasolano@MacBook-Air-de-Noelia-5 ~ % cd ~/Desktop
(base) noeliasolano@MacBook-Air-de-Noelia-5 Desktop % awk -F';' 'BEGIN{OFS=","}
{
    $7="" $7 ""; # Encierra product_ids en comillas
    print
}' datos.csv > datos_limpio.csv
```

Treballo en un Mac, això ha implicat fer algun canvi pel correcte reconeixement de les dades de l'arxiu CSV. A continuació, des de la terminal he ficat els product_ids entre cometes per evitar una mala carrega de dades.



```
1 • CREATE DATABASE company;
2
3 • USE company;
4
5 • CREATE TABLE transactions (
6     id VARCHAR(50) NOT NULL,
7     card_id VARCHAR(20),
8     business_id VARCHAR(20),
9     timestamp TIMESTAMP,
10    amount DECIMAL(10,2),
11    declined TINYINT,
12    product_ids VARCHAR(50),
13    user_id INT,
14    lat FLOAT,
15    longitude FLOAT,
16    PRIMARY KEY (id)
17 );
18
```

Action Output	Time	Action	Response	Duration / Fetch Time
	17	CREATE DATABASE company	1 row(s) affected	0.0056 sec
	18	USE company	0 row(s) affected	0.00038 sec
	19	CREATE TABLE transactions (id VARCHAR(50) NOT NULL, card_id VARCHAR(20), business..	0 row(s) affected	0.042 sec

```

19 • LOAD DATA LOCAL INFILE '/Users/noeliasolano/Downloads/transactionsOK.csv'
20   INTO TABLE transactions
21   FIELDS TERMINATED BY ','
22   ENCLOSED BY ""
23   LINES TERMINATED BY '\n'
24   IGNORE 1 ROWS;
25

100% 15:24

Action Output
Time Action Response Duration / Fetch Time
18 12:19:11 USE company 0 row(s) affected 0.00038 sec
19 12:22:54 CREATE TABLE transactions ( id VARCHAR(50) NOT NULL, card_id VARCHAR(20), business... 0 row(s) affected 0.042 sec
20 12:25:46 LOAD DATA LOCAL INFILE '/Users/noeliasolano/Downloads/transactionsOK.csv' INTO TABLE transa... Error Code: 3948. Loading local data is disabled; this... 0.0037 sec

```

Connection Remote Management System Profile

Connection Method: Standard (TCP/IP) Method to use to connect to the RDBMS

Parameters SSL Advanced

Use compression protocol Select this option for WAN connections.

Use ANSI quotes to quote If enabled this option overwrites the serverside settings.

Enable Cleartext Send user password in cleartext. Required for some authentication methods.

Timeout: 60 Maximum time to wait before a connection is aborted.

SQL_MODE:

Others: DbSqlEditor:LastDefaultSchema=OPT_LOCAL_INFILE=1 ←
lastConnected=1764151579
serverVersion=9.3.0 Other options for Connector/C++ as option=value pairs, one per line.

Duplicate Move Up Move Down Test Connection Close

```

19 • LOAD DATA LOCAL INFILE '/Users/noeliasolano/Downloads/transactionsOK.csv'
20   INTO TABLE transactions
21   FIELDS TERMINATED BY ','
22   ENCLOSED BY ""
23   LINES TERMINATED BY '\n'
24   IGNORE 1 ROWS;
25
26 • SHOW VARIABLES LIKE 'local_infile';
27
28 • SET GLOBAL local_infile = 1;

100% 15:24

Action Output
Time Action Response Duration / Fetch Time
3 11:06:50 USE company 0 row(s) affected 0.00093 sec
4 11:06:54 LOAD DATA LOCAL INFILE '/Users/noeliasolano/Downloads/transactionsOK.csv' INTO TABLE transactions FIELDS TERMINATED... 100000 row(s) affected Records: 100000 Deleted: 0... 1.403 sec

```

```
1 • SELECT * FROM company.transactions;
```

Result Grid

id	card_id	business_id	timestamp	amount	declined	product_ids	user_id	lat	longitude
00043A49-2949-494B-A5D5-A5BAE3BB1BD	Ccs-234	b-2458	2024-08-28 07:16:46	396.43	0	16, 26, 97, 87	4713	46.1999	1.43564
0004477E-B650-4DDF-850E-C7ED0EE1CAAD	Ccs-5019	b-2370	2016-12-31 20:07:18	155.63	0	66, 69, 87	438	41.5972	12.2218
0004506B-ED2E-4F2F-81B6-CED04D87BD0	Ccs-6699	b-2390	2020-07-14 15:37:45	328.01	0	10, 11, 16, 81	2118	29.7573	-96.3796
000481C3-1C28-AEFF-A3A0-ACD0E0B04BBD	Ccs-6696	b-2230	2017-09-04 19:44:53	161.60	0	72	2115	53.5489	-113.503
00051AA4-PCDE-4268-B070-C3B063A1B3E2	Ccs-7608	b-2368	2017-01-05 18:19:26	148.91	0	18	3025	62.2084	5.68091
0008A312-EDFE-44AF-BC99-E9C92EC3CA4D	Ccs-3358	b-2598	2023-09-23 04:51:43	294.59	0	35, 33, 19	215	53.5535	-113.499
0009A151-98CF-4E31-9053-A48BF77FAAB	Ccs-7509	b-2546	2023-12-31 00:06:36	383.63	0	93, 55, 28, 91	2928	51.9362	5.34265
0009D494-6245-4DF9-955D-C2084191CFB	Ccs-8483	b-2526	2017-07-18 07:52:02	197.80	0	55, 8, 72	3902	45.492	-73.5706
000A1DEC-CD86-4A82-A619-71DAB804A262	Ccs-6467	b-2558	2018-09-08 05:29:58	339.94	0	46, 56, 73	1886	55.7425	-3.30009
000A1E64-1414-40B0-9D92-5678A4D958E2	Ccs-5966	b-2550	2022-09-17 04:22:19	369.71	0	16, 89, 19	1385	62.0821	5.28424

transactions 1

Action Output

Time	Action	Response	Duration / Fetch Time
4 11:06:54	LOAD DATA LOCAL INFILE '/Users/noeliasolano/Downloads/transactionsOK.csv' INTO TABLE transactions FIELDS TERMINATED...	100000 row(s) affected Records: 100000 Deleted: 0...	1.403 sec
5 11:07:44	SELECT * FROM company.transactions	100000 row(s) returned	0.0015 sec / 0.164 sec

Problema solucionat, les dades s'han carregat correctament. Ara replicaré el procés adaptant-ho a les característiques de cada CSVs.

```
39 • LOAD DATA LOCAL INFILE '/Users/noeliasolano/Downloads/credit_cards.csv'
40   INTO TABLE credit_cards
41   FIELDS TERMINATED BY ','
42   LINES TERMINATED BY '\n'
43   IGNORE 1 ROWS
44   (id, user_id, iban, pan, pin, cvv, track1, track2, @expiring_date) -- Cal especificar totes les columnes entre parentesis, és el ord
45   SET expiring_date = STR_TO_DATE(@expiring_date, '%m/%d/%y');
46
```

Action Output

Time	Action	Response	Duration / Fetch Time
4 12:09:08	CREATE TABLE credit_cards (id VARCHAR(20) PRIMARY KEY, user_id INT, iban VARCHAR(50), pan VARCHAR(50), pin..., 0 row(s) affected		0.0074 sec
5 12:09:43	LOAD DATA LOCAL INFILE '/Users/noeliasolano/Downloads/credit_cards.csv' INTO TABLE credit_cards FIELDS TERMINATED BY ... 5000 row(s) affected Records: 5000 Deleted: 0 Skip...	5000 row(s) affected Records: 5000 Deleted: 0 Skip...	0.094 sec

```
19 • CREATE TABLE credit_cards (
20   id VARCHAR(20) PRIMARY KEY,
21   user_id INT,
22   iban VARCHAR(50),
23   pan VARCHAR(50),
24   pin VARCHAR(10),
25   cvv VARCHAR(10), -- Millor fer servir varchar, un int eliminaria qualsevol 0 per davant.
26   track1 VARCHAR(50),
27   track2 VARCHAR(50),
28   expiring_date VARCHAR(20)
29 );
30
```

Action Output

Time	Action	Response	Duration / Fetch Time
5 11:07:44	SELECT * FROM company.transactions	100000 row(s) returned	0.0015 sec / 0.164 sec
6 11:49:53	CREATE TABLE credit_cards (id VARCHAR(20) PRIMARY KEY, user_id INT, iban VARCHAR(50), pan VARCHAR(50), pin..., 0 row(s) affected	0 row(s) affected	0.085 sec

```
62 • LOAD DATA LOCAL INFILE '/Users/noeliasolano/Downloads/companies.csv'
63   INTO TABLE companies
64   FIELDS TERMINATED BY ','
65   LINES TERMINATED BY '\n'
66   IGNORE 1 ROWS;
67
```

Action Output

Time	Action	Response	Duration / Fetch Time
7 13:17:17	CREATE TABLE companies (company_id VARCHAR(15) PRIMARY KEY, company_name VARCHAR(50), phone VARCHAR(15... 0 row(s) affected		0.080 sec
8 13:19:08	LOAD DATA LOCAL INFILE '/Users/noeliasolano/Downloads/companies.csv' INTO TABLE companies FIELDS TERMINATED BY ', Li... 100 row(s) affected Records: 100 Deleted: 0 Skip...	100 row(s) affected Records: 100 Deleted: 0 Skip...	0.0098 sec

```

31 • CREATE TABLE companies (
32     company_id VARCHAR(15) PRIMARY KEY,
33     company_name VARCHAR(50),
34     phone VARCHAR(15),
35     email VARCHAR(50),
36     country VARCHAR(20),
37     website VARCHAR(100)
38 );
39

```

Action Output

Time	Action	Response	Duration / Fetch Time
6 12:12:18	SELECT * FROM company.credit_cards	5000 row(s) returned	0.00081 sec / 0.0091
7 13:17:17	CREATE TABLE companies (company_id VARCHAR(15) PRIMARY KEY, company_name VARCHAR(50), phone VARCHAR(15)...)	0 row(s) affected	0.080 sec

Analitzant els CSVs observem que existeixen american_users i european_users amb mateixa estructura de dades i IDs únics que no se solapen entre si, sinó que es concatenen entre les dues taules. Donada la situació, he pres la decisió de carregar i unir el contingut dels arxius CSV d'american_users i european_users en una sola taula per poder optimitzar les consultes relatives a usuaris-transaccions o altres menestres.

OPCIONAL: Per no perdre informació he decidit crear una columna extra anomenada continent on s'indica si és “america” o “europe”.

```

40 • CREATE TABLE users (
41     id INT PRIMARY KEY,
42     name VARCHAR(20),
43     surname VARCHAR(20),
44     phone VARCHAR(15),
45     email VARCHAR(50),
46     birth_date DATE,
47     country VARCHAR(20),
48     city VARCHAR(20),
49     postal_code VARCHAR(15),
50     address VARCHAR(50),
51     continent VARCHAR(15)
52 );
53

```

Action Output

Time	Action	Response	Duration / Fetch Time
5 14:27:28	CREATE TABLE users (id INT PRIMARY KEY, name VARCHAR(20), surname VARCHAR(20), phone VARCHAR(15), email...)	0 row(s) affected	0.028 sec

```

81 • LOAD DATA LOCAL INFILE '/Users/noeliaSolano/Downloads/american_users.csv'
82     INTO TABLE users
83     FIELDS TERMINATED BY ','
84     ENCLOSED BY '"' -- La data de naixement esta entre cometes.
85     LINES TERMINATED BY '\n'
86     IGNORE 1 ROWS
87     (id, name, surname, phone, email, @birth_date, country, city, postal_code, address)
88     SET
89         birth_date = STR_TO_DATE(@birth_date, '%b %d, %Y'),
90         continent = 'America';
91
92 • LOAD DATA LOCAL INFILE '/Users/noeliaSolano/Downloads/european_users.csv'
93     INTO TABLE users
94     FIELDS TERMINATED BY ','
95     ENCLOSED BY '"'
96     LINES TERMINATED BY '\n'
97     IGNORE 1 ROWS
98     (id, name, surname, phone, email, @birth_date, country, city, postal_code, address)
99     SET
100        birth_date = STR_TO_DATE(@birth_date, '%b %d, %Y'),
101        continent = 'Europe';

```

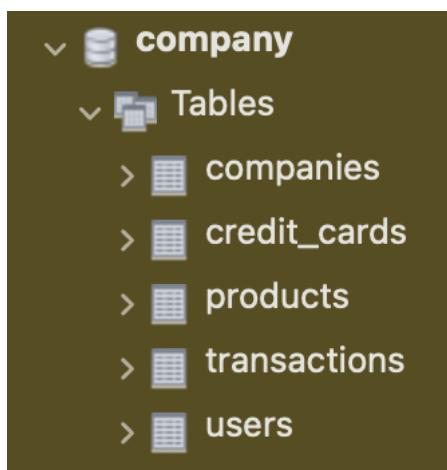
Action Output

Time	Action	Response	Duration / Fetch Time
5 14:27:28	CREATE TABLE users (id INT PRIMARY KEY, name VARCHAR(20), surname VARCHAR(20), phone VARCHAR(15), email...)	0 row(s) affected	0.028 sec
6 14:28:08	LOAD DATA LOCAL INFILE '/Users/noeliaSolano/Downloads/american_users.csv' INTO TABLE users FIELDS TERMINATED BY ',' E... 1010 row(s) affected Records: 1010 Deleted: 0 Skipp... 0.042 sec		
7 14:28:18	LOAD DATA LOCAL INFILE '/Users/noeliaSolano/Downloads/european_users.csv' INTO TABLE users FIELDS TERMINATED BY ',' E... 3990 row(s) affected Records: 3990 Deleted: 0 Skip... 0.092 sec		

```
CREATE TABLE products (
    id INT PRIMARY KEY,
    product_name VARCHAR(50),
    price DECIMAL(10,2),
    colour CHAR(7), -- codis de colors hexadecimals (longitud fixa - CHAR)
    weight DECIMAL(10,2),
    warehouse_id VARCHAR(10)
);

-- Abans de carregar dades es important que local_infile sigui actiu.
```

```
112 • LOAD DATA LOCAL INFILE '/Users/noeliaсолано/Downloads/products.csv'  
113   INTO TABLE products  
114   FIELDS TERMINATED BY ','  
115   LINES TERMINATED BY '\n'  
116   IGNORE 1 ROWS  
117   (id, product_name, @price, colour, weight, warehouse_id)  
118   SET price = REPLACE(@price, '$', '');  
119
```





Aquest és el primer esborrany de com es podrien connectar les taules formant un diagrama en forma d'estrella. La taula transactions quedaria com la taula de fets atès que exemplifica les mètriques numèriques relatives al procés comercial. La resta de les taules contenen atributs per tant es relacionaran com a dimensions de la mateixa.

A primera observació, hi ha camps la denominació dels quals no encaixa ni exemplifica la relació entre taules, per exemple, transactions.business_id i companies.company_id. Ho resoldrem a continuació amb un RENAME.

Una altra dada per resoldre serà com relacionar la taula products atès que la taula transactions, columna producto_ids pot tenir més d'un valor per registre.

```

127 -- Relacionem taules
128 • ALTER TABLE transactions
129   ADD CONSTRAINT fk_transactions_users FOREIGN KEY(user_id) REFERENCES users(id);
130
131 • ALTER TABLE transactions
132   ADD CONSTRAINT fk_transactions_credit_cards FOREIGN KEY(card_id) REFERENCES credit_cards(id);
133
134 • ALTER TABLE transactions
135   ADD CONSTRAINT fk_transactions_companies FOREIGN KEY(business_id) REFERENCES companies(id);
  ◇ 92:136
  
```

Action Output	Time	Action	Response	Duration / Fetch Time
9	11:30:33	ALTER TABLE transactions ADD CONSTRAINT fk_transactions_users FOREIGN KEY(user_id) REFERENCES users(id)	100000 row(s) affected Records: 100000 Duplicates:...	1.302 sec
10	11:30:38	ALTER TABLE transactions ADD CONSTRAINT fk_transactions_credit_cards FOREIGN KEY(card_id) REFERENCES credit_cards(id)	100000 row(s) affected Records: 100000 Duplicates:...	1.643 sec
11	11:30:42	ALTER TABLE transactions ADD CONSTRAINT fk_transactions_companies FOREIGN KEY(business_id) REFERENCES companies(...	100000 row(s) affected Records: 100000 Duplicates:...	1.740 sec

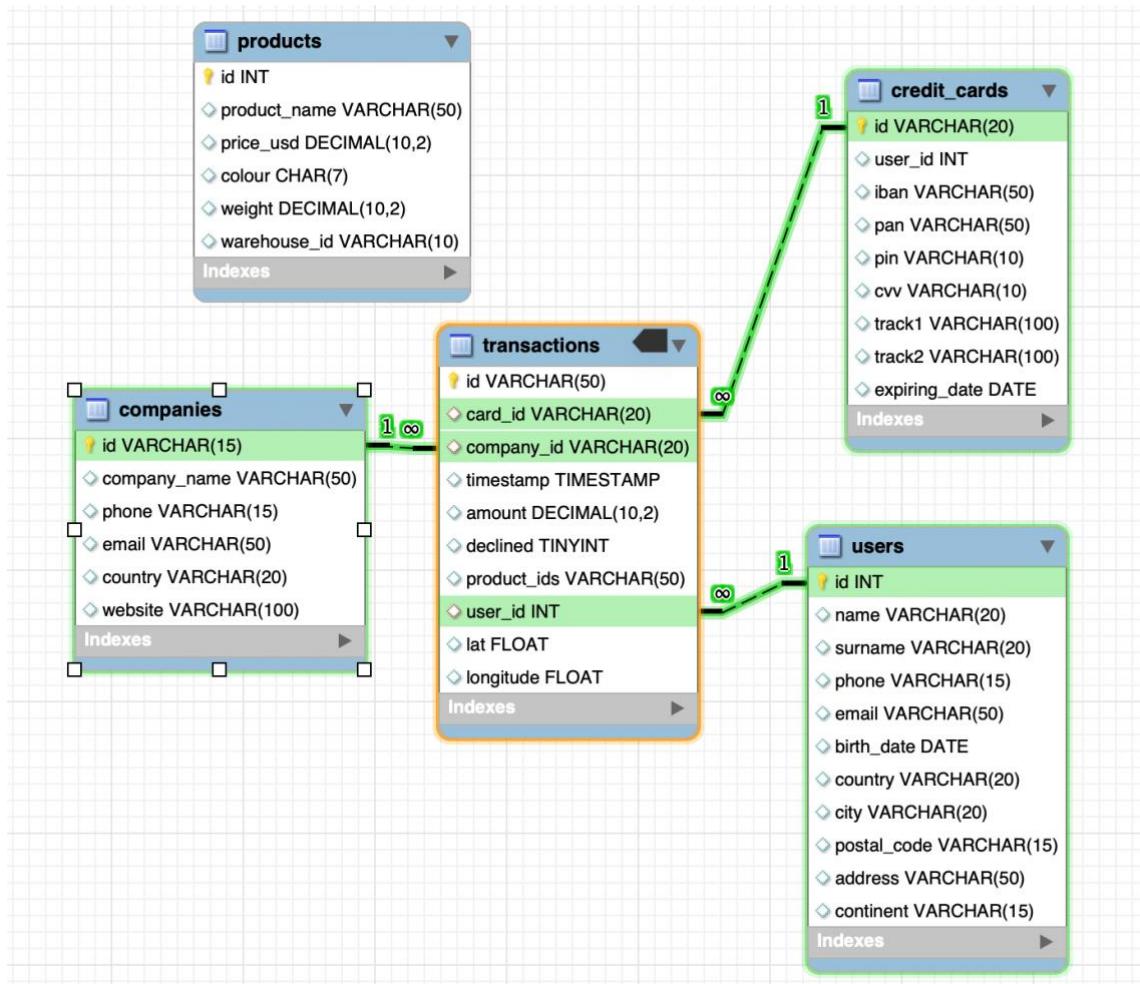
```

120 -- Correccions de les taules
121 • ALTER TABLE products
122   RENAME COLUMN price TO price_usd;
123
124 • ALTER TABLE companies
125   RENAME COLUMN company_id TO id;
126
127 • ALTER TABLE transactions
128   RENAME COLUMN business_id TO company_id;|
```

Action Output | Time | Action | Response | Duration / Fetch Time

16 12:50:03 ALTER TABLE transactions RENAME COLUMN business_id TO company_id 0 row(s) affected Records: 0 Duplicates: 0 Warnings... 0.099 sec

Diagrama:



EXERCICI 1

```

146
147 -- Exercici 1: Mostra usuaris amb més de 80 transaccions utilitzant almenys 2 taules. Fes una subconsulta
148
149 • SELECT *
150   FROM users u
151   WHERE EXISTS(
152     SELECT 1
153     FROM transactions t
154     WHERE t.user_id = u.id AND declined=0
155     GROUP BY t.user_id
156     HAVING COUNT(t.id) > 80
157   );
100% 3:157 |
```

Result Grid Filter Rows: Search: Edit: Export/Import:

id	name	surname	phone	email	birth_date	country	city	postal_code	address	continent
185	Molly	Gilliam	0800 120 8023	donec@outlook.co.uk	1993-12-21	United Kingdom	London	EC1A 1BB	P.O. Box 202, 5638 Ml Rd.	Europe
289	Dxwg	Hwcr	+98-309-8797	dxwg.hwcr@example.com	1976-08-20	Germany	Stuttgart	70173	82 Hwcr Street	Europe
318	Bnyr	Astuw	+33-120-9644	bnyr.astuw@example.com	1974-05-03	Italy	Genoa	16100	53 Astuw Street	Europe

users 48

Action Output

Time	Action	Response	Duration / Fetch Time
13:52:07	SELECT * FROM users u WHERE EXISTS(SELECT 1 FROM transactions t WHERE t.user_id = u.id AND declined=0 -- REEM...	0.300 sec / 0.000012...
13:52:29	SELECT * FROM users u WHERE EXISTS(SELECT 1 FROM transactions t WHERE t.user_id = u.id AND declined=0 GROU...	0.300 sec / 0.000042...

EXERCICI 2

```

163
164 -- Exercici 2: Mostra la mitjana d'amount per IBAN de les targetes de crèdit a la companyia Donec Ltd, utilitza almenys 2 taules.
165
166 • SELECT c.company_name, cc.iban, AVG(t.amount) AS amount
167   FROM transactions t
168   JOIN companies c ON c.id=t.company_id
169   JOIN credit_cards cc ON cc.id=t.card_id
170   WHERE c.company_name='Donec Ltd'
171   GROUP BY c.id, cc.iban;
172
100% 24:171 |
```

Result Grid Filter Rows: Search: Export:

company_name	iban	amount
Donec Ltd	XK911406401125586307586805	356.246667
Donec Ltd	SK944637024247458257506	142.960000
Donec Ltd	XX77675291784595297555640	257.370000

Result 30

Action Output

Time	Action	Response	Duration / Fetch Time
12:05:21	SELECT c.company_name, cc.iban, AVG(t.amount) AS amount FROM transactions t JOIN companies c ON c.id=t.company_id JOI...	371 row(s) returned	0.021 sec / 0.000060...

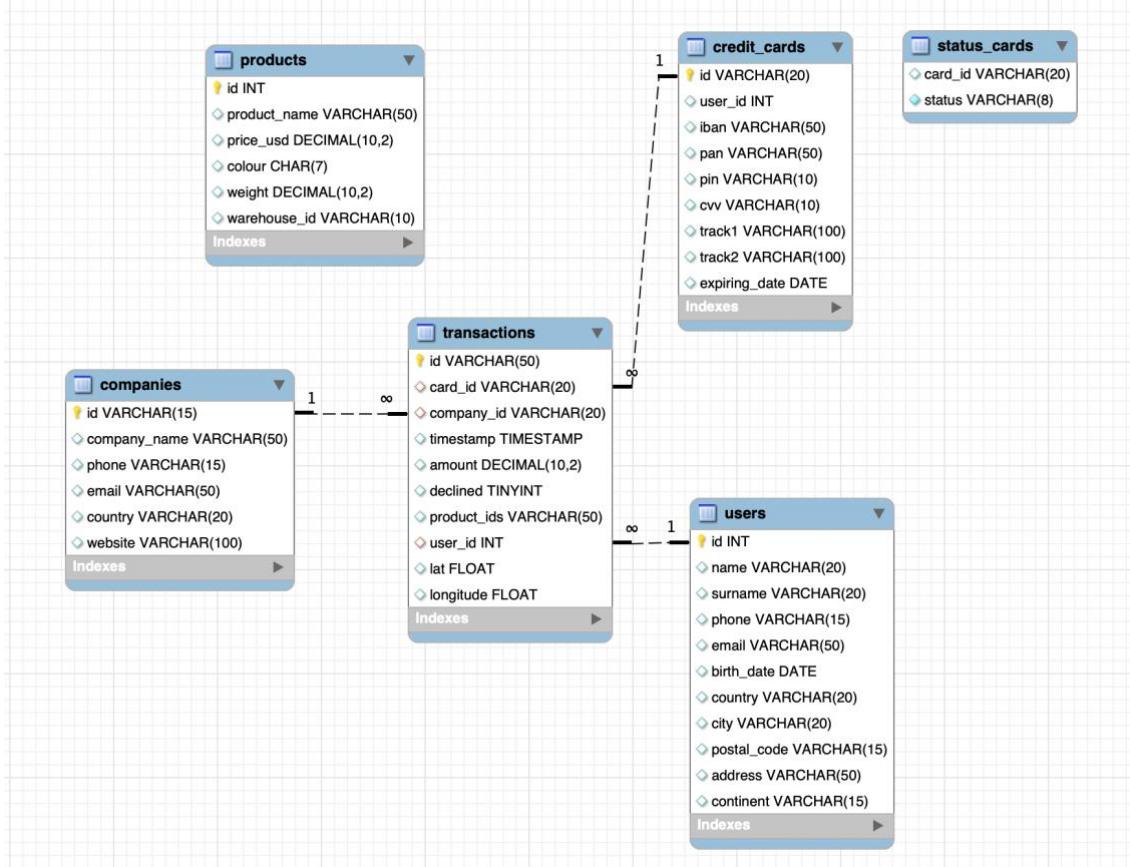
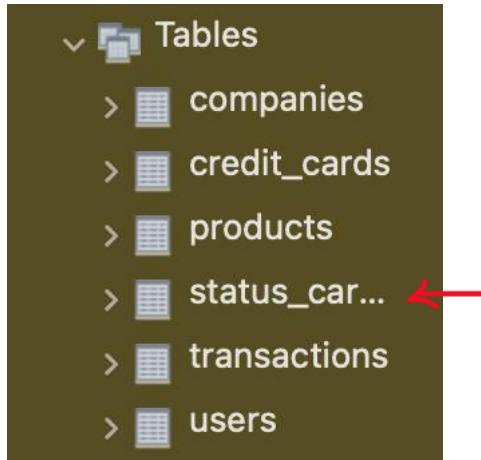
NIVELL 2

```

163
164 -- NIVELL 2
165 -- Nova taula d'estat de les targetes: si les tres últimes transaccions han estat declinades = inactiu, si almenys una no és rebutjada = actiu
166
167 -- Utilitzem una window function: ROW_NUMBER() que ordena i numera
168 • CREATE TABLE status_cards AS
169   SELECT
170     x.card_id,
171     CASE
172       WHEN SUM(declined) = 3
173       THEN 'inactive'
174       ELSE 'active'
175     END AS status -- Hem creat un sumatori
176   FROM(
177     SELECT t.*,
178     ROW_NUMBER() OVER (PARTITION BY t.card_id ORDER BY t.timestamp DESC) AS rn
179     FROM transactions t
180   ) x
181   WHERE rn <= 3
182   GROUP BY x.card_id;
100% 20:182 |
```

Action Output

Time	Action	Response	Duration / Fetch Time
11:14:10	CREATE TABLE status_cards AS SELECT x.card_id, CASE WHEN SUM(declined) = 3 THEN 'inactive' ELSE 'active' END AS s...	5000 row(s) affected Records: 5000 Duplicates: 0...	0.569 sec

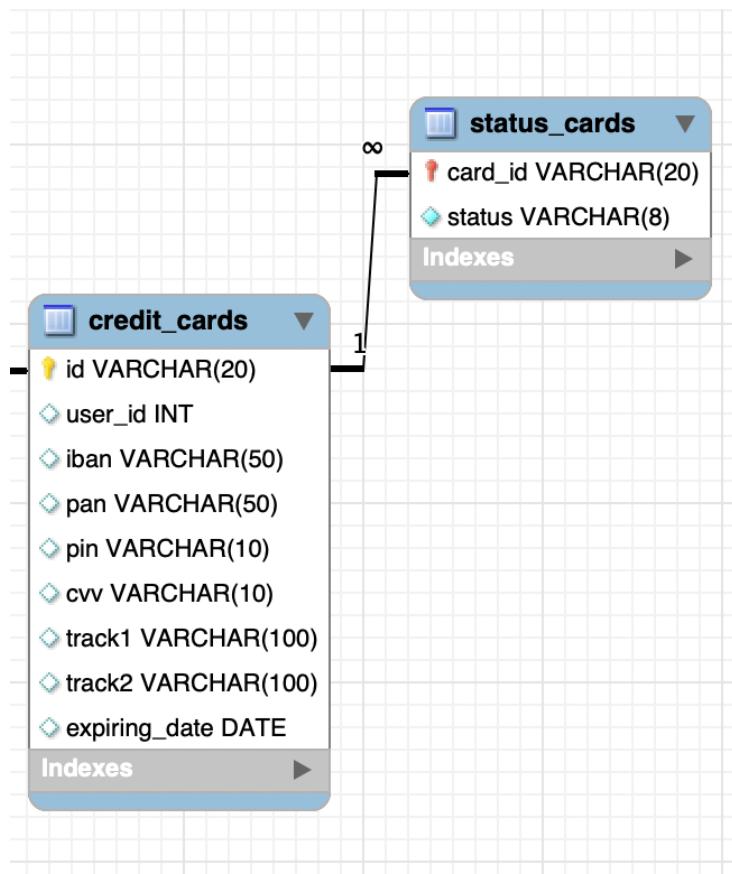


Mysql marca l'atribut status en blau perquè creu que esta indexada, falta definir Primary Key i Foreign Key.

```

189 -- Relacionem la taula
190 • ALTER TABLE status_cards
191 ADD CONSTRAINT pk_status_cards PRIMARY KEY (card_id);
192
193 • ALTER TABLE status_cards
194 ADD CONSTRAINT fk_status_cards_credit_cards FOREIGN KEY (card_id) REFERENCES credit_cards(id);
195
100% ◇ 95:194
  
```

Action Output	Time	Action	Response	Duration / Fetch Time
	108 11:08:54	ALTER TABLE status_cards ADD CONSTRAINT pk_status_cards PRIMARY KEY (card_id)	0 row(s) affected Records: 0 Duplicates: 0 Warnings:... 0.051 sec	
	109 11:08:57	ALTER TABLE status_cards ADD CONSTRAINT fk_status_cards_credit_cards FOREIGN KEY (card_id) REFERENCES credit_cards...	5000 row(s) affected Records: 5000 Duplicates: 0... 0.072 sec	



CORRECCIÓ: Ara la card_id es una Primary Key i una Foreign Key al mateix cop. La línia continua relacional entre les taules indica una relació exclusiva i obligatòria entre les taules.

NIVELL 2

```

184 -- Exercici 1: Quantes targetes estan actives?
185
186
187 • SELECT COUNT(sc.status)
188   FROM status_cards sc
189   WHERE sc.status = 'active';

```

Result Grid

COUNT(sc.status)
4995

Result 27

Action Output

Time	Action	Response	Duration / Fetch Time
67 11:32:33	SELECT COUNT(sc.status) FROM status_cards sc WHERE sc.status = 'active'	1 row(s) returned	0.0058 sec / 0.0000...

JSON: Degut a que aquest format reconeix el conjunt de valors per registre com un array, es possible fer una tabla intermitja sense problemes relacionals.

NIVELL 3

```

194 -- Nivell 3
195 -- Crea una taula amb la qual pugem unir les dades del nou arxiu products.csv amb la base de dades creada, tenint en compte que des de transaction tens product_ids
196
197 -- Product_ids passa de VARCHAR a ser tipus JSON
198 UPDATE transactions
199 SET product_ids = CONCAT('[', REPLACE(product_ids,' ',''), ']') -- Treiem els espais
200 LIMIT 9999999;
201
202

```

Action Output

Time	Action	Response	Duration / Fetch Time
83 14:20:27	UPDATE transactions SET product_ids = CONCAT('[', REPLACE(product_ids,' ',''), ']') -- Treiem els espais LIMIT 9999999	100000 row(s) affected Rows matched: 100000 Ch... 1.634 sec	

En aquest cas afegim LIMIT per solucionar el següent error:

Error Code: 1175. You are using safe update mode and you tried to update a table without a WHERE that uses a KEY column. To disable safe mode, toggle the option in Preferences -> SQL Editor and reconnect

Error tipic de MySql, Safe Mode Update sempre exigeix aplicar un filtre selectiu per fer un Update per no actualitzar tota la taula.

```

1 • SELECT * FROM company.transactions;


```

Result Grid

id	card_id	company_id	timestamp	amount	declined	product_ids	user_id	lat	longitude
00043AA9-2949-4941-A5UU-A58A:3B8190UJ	CcS-9294	b-2458	2024-08-29 07:16:46	395.43	0	[16.26,97.87]	4713	48.1999	1.435054
000447FE-B650-4DCF-85DE-C7ED0EE1CAAD	CcS-5019	b-2370	2016-12-21 20:07:18	155.63	0	[66.69,87]	438	41.5972	12.2218
00045D6B-E2E2-4FF2-8186-CEE074D875D0	CcS-6699	b-2390	2020-07-14 15:37:45	326.01	0	[30.11,16.81]	2118	29.7573	-95.3796
000481C3-1C28-4FFC-83A0-4CDEB004BBD	CcS-6696	b-2230	2017-09-04 19:44:53	161.60	0	[72]	2115	53.5489	-113.503
00051AA4-9CBE-4268-B070-C38062A1B3E2	CcS-7606	b-2266	2017-01-05 18:19:25	148.91	0	[18]	3025	52.2084	5.69081
0008A312-EDF4-4A4F-BC99-E9C92EC3CAMD	CcS-3358	b-2598	2023-09-23 04:51:43	294.59	0	[35.33,19]	215	53.5535	-113.499
0009A151-9BCF-4E31-9053-A468F77FAAB	CcS-7509	b-2546	2023-12-31 00:06:36	383.63	0	[83.55,28.91]	2928	51.9362	5.34266
0009D494-6245-4DF9-955D-2C084191CFBB	CcS-8483	b-2526	2017-07-18 07:52:02	197.80	0	[55.8,72]	3902	45.492	-73.5706

transactions 1

Action Output

Time	Action	Response	Duration / Fetch Time
84 14:28:19	SELECT * FROM company.transactions	100000 row(s) returned	0.0085 sec / 0.144 sec

```

203 -- Creacio de la taula
204 CREATE TABLE transactions_products AS
205 SELECT t.id AS transaction_id, jt.product_id
206 FROM transactions t
207 JOIN JSON_TABLE( -- Taula temporal
208   t.product_ids,
209   '$[*]' COLUMNS(
210     product_id INT PATH '$' -- Definició del nom i tipus
211   )
212 ) AS jt
213 ORDER BY transaction_id;
214


```

Action Output

Time	Action	Response	Duration / Fetch Time
97 12:22:04	CREATE TABLE transactions_products AS SELECT t.id AS transaction_id, jt.product_id FROM transactions t JOIN JSON_TABLE(...	253391 row(s) affected Records: 253391 Duplicates:... 1.487 sec	

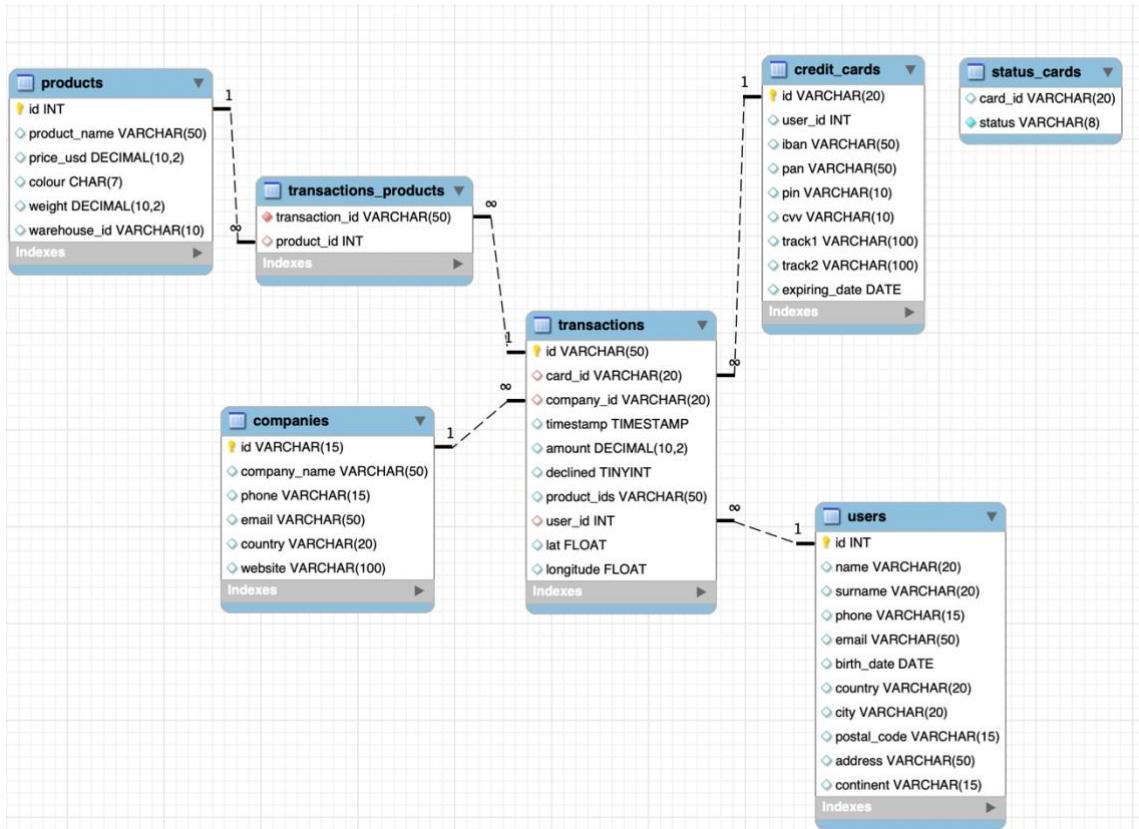
```

215 -- Relacionem la taula
216 • ALTER TABLE transactions_products
217 ADD CONSTRAINT fk_tp_transactions FOREIGN KEY (transaction_id) REFERENCES transactions(id);
218
219 • ALTER TABLE transactions_products
220 ADD CONSTRAINT fk_tp_products FOREIGN KEY (product_id) REFERENCES products(id);
221
100% 8:22:00

```

Action Output

Time	Action	Response	Duration / Fetch Time
99 12:24:57	ALTER TABLE transactions_products ADD CONSTRAINT fk_tp_transactions FOREIGN KEY (transaction_id) REFERENCES transactions(id)	253391 row(s) affected Records: 253391 Duplicates:... 2.060 sec	
100 12:25:01	ALTER TABLE transactions_products ADD CONSTRAINT fk_tp_products FOREIGN KEY (product_id) REFERENCES products(id)	253391 row(s) affected Records: 253391 Duplicates:... 1.757 sec	



MySQL ha interpretat per defecte com a Primary Key (PK) transaction_id, això pot generar problemes ja que no un valor únic i la nostra relació entre taules no és 1:N sinó N:M. Per això, faré servir una PK combinada:

```

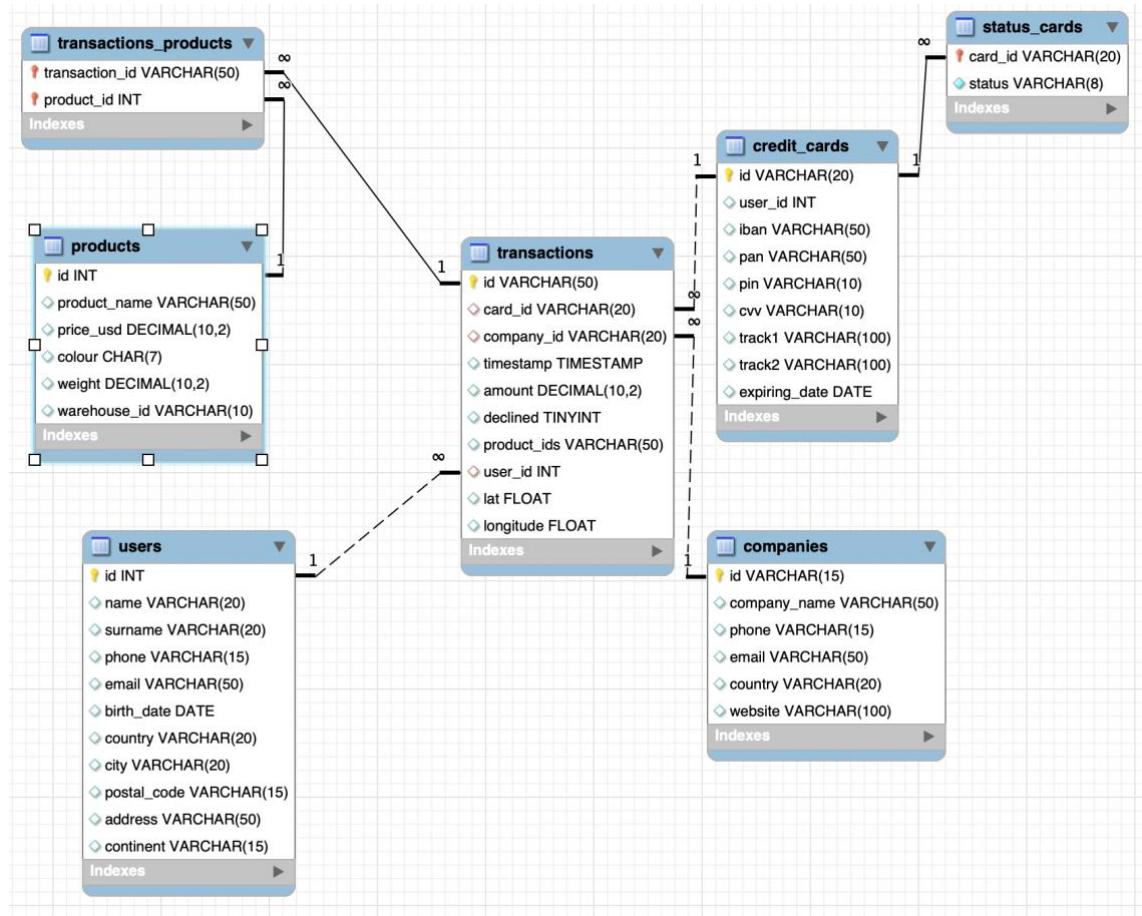
222 • ALTER TABLE transactions_products
223 ADD PRIMARY KEY (transaction_id, product_id);
224
100% 46:22:31

```

Action Output

Time	Action	Response	Duration / Fetch Time
100 12:25:01	ALTER TABLE transactions_products ADD CONSTRAINT fk_tp_products FOREIGN KEY (product_id) REFERENCES products(id)	253391 row(s) affected Records: 253391 Duplicates:... 1.757 sec	
101 12:43:13	ALTER TABLE transactions_products ADD PRIMARY KEY (transaction_id, product_id)	0 row(s) affected Records: 0 Duplicates: 0 Warnings:... 0.776 sec	

Diagrama Final:



Les línies contínues ens indiquen una relació de les dades de **transactions_products** depenen exclusiva i obligatòria de registres en les altres dues taules, no té cap variable no dependent d'aquestes.

EXERCICI 1

```

234
235 -- Exercici 1: Necesitem conèixer el nombre de vegades que s'ha venut cada producte.
236
237 • SELECT ts.product_id, COUNT(ts.transaction_id) AS Sales
238   FROM transactions_products ts
239   GROUP BY ts.product_id
240   ORDER BY product_id ASC;
100% ◇ 25:240 |
```

product_id	Sales
1	2468
2	2573
3	2528

Result Grid Filter Rows: Q Search Export: CSV Result Grid Read Only

Action Output	Time	Action	Response	Duration / Fetch Time
123	14:02:15	SELECT COUNT(ts.transaction_id) AS Sales, ts.product_id FROM transactions_products ts GROUP BY ts.product_id ORDER BY...	100 row(s) returned	0.098 sec / 0.00028...
124	14:02:44	SELECT ts.product_id, COUNT(ts.transaction_id) AS Sales FROM transactions_products ts GROUP BY ts.product_id ORDER BY...	100 row(s) returned	0.060 sec / 0.000017...

Comentaris de millora Peer-to-Peer aplicats:

- Utilitzar EXISTS en lloc de IN en les subconsultes
- Afegir declined=0 si consultem transaccions