

MEMORIA

Práctica 3 - Sistemas informáticos

Actualización de BBDD

En la tercera práctica de Sistemas Informáticos, a la cual se refiere esta memoria, lo primero que se solicita a los alumnos (además del diagrama E-R ya entregado en la entrega parcial) es un script SQL (*actualizar.sql*) para adaptar la base de datos proporcionada a las necesidades de la práctica. A continuación procederemos a describir los cambios realizados:

1. Nuevas tablas

Se han añadido varias tablas (*shipping_address*, *creditcard*) destinadas a separar y hacer más manejable la información de la tabla *customers*, que era enorme. Además, se han añadido las relaciones necesarias (i.e. *client_creditcard*) para asegurarse del correcto acceso a ellas. Como decisiones de diseño en esta etapa hemos decidido que un usuario pueda tener varias tarjetas de crédito y que la dirección sea una entidad débil de usuario.

Además, se han debido añadir tablas necesarias para completar los requerimientos de la práctica (tabla *alerts*). Estas se han diseñado con el mínimo número de atributos que las hace funcionales.

2. Añadir constraints (foreign keys, unique...)

Uno de los mayores problemas de la base de datos proporcionada era la falta de vínculos entre relaciones (constraints). Para resolver este problema, se han añadido constraints de *foreign key* a las tablas de relaciones que no las tenían (i.e. *orderdetail*), añadiendo que se borren en cascada cuando fuera útil (eliminar una *order* elimina todos sus *orderdetails*).

Otro problema que nos encontramos fue la no unicidad del campo *username* en la tabla *customers*. Para resolver el mismo hemos debido eliminar todos los usuarios repetidos y luego instaurar una constraint *unique* sobre dicho campo. NOTA: Esta query es costosa y lenta, pero necesaria para el correcto funcionamiento de la aplicación. Además, sólo es necesaria al actualizar la base de datos, más tarde el constraint *unique* se asegura de que la tabla permanezca correcta.

3. Eliminar atributos repetidos o inútiles

Se han eliminado diversos atributos o constraints escasamente útiles para la lógica de la aplicación, como por ejemplo los constraints *not null* de los campos *firstname* y *lastname* de *customers*.

4. Eliminar filas no compatibles con la aplicación

Como se ha mencionado en el anterior apartado, se han eliminado records cuya repetición afectaba al buen funcionamiento de la aplicación. Ejemplos son el campo *username* repetido de *customers*, cuyas repeticiones fueron eliminadas; o los records de *orders* con status = NULL que la práctica exige que sólo haya uno en cada momento como máximo.

IMPORTANTE

Se ha implementado un script “init_db.sh” que ejecuta todos los comandos necesarios para cargar la base de datos, actualizarla e incluir todos los queries, procedimientos y triggers solicitados. Para ejecutar este script es necesario tener el archivo de dump en la carpeta p3 si se desea cargar desde 0 la base de datos. En caso contrario no lo encontrará y proseguirá la ejecución. Si no se dispone de un archivo .pgpass o similares, se deberá introducir la contraseña para el usuario *alumnodb* en cada paso.

Ejemplos de ejecución de las queries

C. setPrice.sql

```
hey@hey: ~/Desktop/practicas/SI/p3
si1=# SELECT * FROM orderdetail ORDER BY orderid LIMIT 10;
 orderid | prod_id | price | quantity
-----+-----+-----+-----
 1 | 1938 |  | 1
 1 | 1014 |  | 1
 1 | 1288 |  | 1
 2 | 2443 |  | 1
 2 | 3229 |  | 1
 3 | 3777 |  | 1
 3 | 696 |  | 1
 3 | 268 |  | 1
 3 | 1467 |  | 1
 3 | 1766 |  | 1
(10 rows)

si1=# ^C
si1=# \q
hey@hey:~/Desktop/practicas/SI/p3$ psql -U alumnodb -h localhost -d si1 -f set
setOrderAmountArg.sql setOrderAmount.sql setPrice.sql
hey@hey:~/Desktop/practicas/SI/p3$ psql -U alumnodb -h localhost -d si1 -f setPrice.sql
Password for user alumnodb:
UPDATE 1000072
hey@hey:~/Desktop/practicas/SI/p3$ psql -U alumnodb -h localhost si1
Password for user alumnodb:
psql (10.6 (Ubuntu 10.6-0ubuntu0.18.10.1))
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, bits: 256, compression: off)
Type "help" for help.

si1=# SELECT * FROM orderdetail ORDER BY orderid LIMIT 10;
 orderid | prod_id | price | quantity
-----+-----+-----+-----
 1 | 1938 | 10.57302576 | 1
 1 | 1014 | 10.57302576 | 1
 1 | 1288 | 10.57302576 | 1
 2 | 3229 | 13.7256 | 1
 2 | 2443 | 15.6864 | 1
 3 | 1766 | 17.6472 | 1
 3 | 4505 | 20.00016 | 1
 3 | 4256 | 12.7452 | 1
 3 | 1467 | 20.00016 | 1
```

D. setOrderAmount.sql

```
hey@hey: ~/Desktop/practicas/SI/p3
Type "help" for help.

si1=# SELECT * FROM orders ORDER BY orderid LIMIT 10;
 orderid | orderdate | netamount | tax | totalamount | status
-----+-----+-----+-----+-----+-----
      1 | 2016-07-21 |          | 15 |          | Shipped
      2 | 2017-01-27 |          | 15 |          | Shipped
      3 | 2017-09-11 |          | 18 |          | Paid
      4 | 2016-08-18 |          | 15 |          | Shipped
      5 | 2015-09-01 |          | 15 |          | Shipped
      6 | 2015-03-05 |          | 15 |          | Shipped
      7 | 2018-01-26 |          | 18 |          | Shipped
      8 | 2016-11-04 |          | 15 |          | Processed
      9 | 2014-04-14 |          | 15 |          | Shipped
     10 | 2013-07-25 |          | 15 |          | Shipped
(10 rows)

si1=# \q
hey@hey:~/Desktop/practicas/SI/p3$ psql -U alumnodb -h localhost -d si1 -f setOrderAmount.sql
Password for user alumnodb:
psql:setOrderAmount.sql:1: NOTICE: function set_order_amount() does not exist, skipping
DROP FUNCTION
CREATE FUNCTION
DO
hey@hey:~/Desktop/practicas/SI/p3$ psql -U alumnodb -h localhost si1
Password for user alumnodb:
psql (10.6 (Ubuntu 10.6-0ubuntu0.18.10.1))
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, bits: 256, compression: off)
Type "help" for help.

si1=# SELECT * FROM orders ORDER BY orderid LIMIT 10;
 orderid | orderdate | netamount | tax | totalamount | status
-----+-----+-----+-----+-----+-----
      1 | 2016-07-21 | 31.71907728 | 15 | 36.476938872 | Shipped
      2 | 2017-01-27 | 29.4120 | 15 | 33.8238 | Shipped
      3 | 2017-09-11 | 158.43264 | 18 | 186.9505152 | Paid
      4 | 2016-08-18 | 132.547295664 | 15 | 152.4293900136 | Shipped
      5 | 2015-09-01 | 86.695735442688 | 15 | 99.7000957590912 | Shipped
      6 | 2015-03-05 | 61.3466562752064 | 15 | 70.5486547164873 | Shipped
      7 | 2018-01-26 | 12 | 18 | 14.16 | Shipped
      8 | 2016-11-04 | 136.488150720 | 15 | 156.961373328 | Processed
(10 rows)
```

E. getTopVentas.sql

```
hey@hey: ~/Desktop/practicas/SI/p3
Type "help" for help.

si1=# SELECT * FROM orders ORDER BY orderid LIMIT 10;
 orderid | orderdate | netamount | tax | totalamount | status
-----+-----+-----+-----+-----+-----
      1 | 2016-07-21 |          | 15 |          | Shipped
      2 | 2017-01-27 |          | 15 |          | Shipped
      3 | 2017-09-11 |          | 18 |          | Paid
      4 | 2016-08-18 |          | 15 |          | Shipped
      5 | 2015-09-01 |          | 15 |          | Shipped
      6 | 2015-03-05 |          | 15 |          | Shipped
      7 | 2018-01-26 |          | 18 |          | Shipped
      8 | 2016-11-04 |          | 15 |          | Processed
      9 | 2014-04-14 |          | 15 |          | Shipped
     10 | 2013-07-25 |          | 15 |          | Shipped
(10 rows)

si1=# \q
hey@hey:~/Desktop/practicas/SI/p3$ psql -U alumnodb -h localhost -d si1 -f setOrderAmountArg.sql
Password for user alumnodb:
psql:setOrderAmountArg.sql:1: NOTICE: function set_order_amount_arg() does not exist, skipping
DROP FUNCTION
CREATE FUNCTION
hey@hey:~/Desktop/practicas/SI/p3$ psql -U alumnodb -h localhost -d si1 -f getTopVentas.sql
Password for user alumnodb:
psql:getTopVentas.sql:1: NOTICE: function gettopventas() does not exist, skipping
DROP FUNCTION
CREATE FUNCTION
hey@hey:~/Desktop/practicas/SI/p3$ psql -U alumnodb -h localhost si1
Password for user alumnodb:
psql (10.6 (Ubuntu 10.6-0ubuntu0.18.10.1))
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, bits: 256, compression: off)
Type "help" for help.

si1=# SELECT * FROM gettopventas(1997);
 year | movietitle | ventas
-----+-----+-----
 2012 | Casino (1995) | 5
 2013 | Odessa File, The (1974) | 11
 2014 | Life Less Ordinary, A (1997) | 9
 2015 | Forgotten, The (1973) | 9
 2016 | Night Shift (1982) | 9
 2017 | Reality Bites (1994) | 10
 2018 | Up in Smoke (1978) | 10
(7 rows)

si1=#
```

F. getTopMonths.sql

```
hey@hey: ~/Desktop/practicas/SI/p3
2017 | 10 | 18576 | 350332.5398928
2016 | 1 | 18399 | 331358.6129006376
2016 | 3 | 18683 | 335751.3206302536
2016 | 4 | 18541 | 332095.5576020304
2016 | 7 | 19280 | 346043.2336648992
2015 | 5 | 19001 | 334727.3579090996821
2015 | 10 | 18698 | 330608.3351485482914
2014 | 9 | 19133 | 330220.2171105983668
2014 | 10 | 19086 | 329345.3906443525592
(13 rows)

si1=# \q
hey@hey:~/Desktop/practicas/SI/p3$ psql -U alumnodb -h localhost -d si1 -f getTopMonths.sql
Password for user alumnodb:
DROP FUNCTION
CREATE FUNCTION
hey@hey:~/Desktop/practicas/SI/p3$ psql -U alumnodb -h localhost si1
Password for user alumnodb:
psql (10.6 (Ubuntu 10.6-0ubuntu0.18.10.1))
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, bits: 256, compression: off)
Type "help" for help.

si1=# SELECT * FROM gettopmonths(19000, 330000);
 year | month | num_ventas | ingresos_totales
-----+-----+-----+-----
 2017 | 1 | 18598 | 341429.501022
 2017 | 5 | 18068 | 331039.393392
 2017 | 8 | 18522 | 339399.960276
 2017 | 9 | 18387 | 342849.6319908
 2017 | 10 | 18576 | 350332.5398928
 2016 | 1 | 18399 | 331358.6129006376
 2016 | 3 | 18683 | 335751.3206302536
 2016 | 4 | 18541 | 332095.5576020304
 2016 | 7 | 19280 | 346043.2336648992
 2015 | 5 | 19001 | 334727.3579090996821
 2015 | 10 | 18698 | 330608.3351485482914
 2014 | 9 | 19133 | 330220.2171105983668
 2014 | 10 | 19086 | 329345.3906443525592
(13 rows)

si1=#
```

G. updOrders.sql

```
hey@hey: ~/Desktop/practicas/SI/p3

si1=# SELECT * FROM orders WHERE orderid = 3;
 orderid | orderdate | netamount | tax | totalamount | status
-----+-----+-----+-----+-----+-----
      3 | 2017-09-11 | 158.43264 | 18 | 186.9505152 | Paid
(1 row)

si1=# SELECT * FROM orderdetail WHERE orderid = 3;
 orderid | prod_id | price | quantity
-----+-----+-----+-----
      3 | 268 | 17.6472 | 1
      3 | 4256 | 12.7452 | 1
      3 | 3777 | 12.7452 | 1
      3 | 1467 | 20.00016 | 1
      3 | 4794 | 9.804 | 1
      3 | 3215 | 22.35312 | 1
      3 | 1766 | 17.6472 | 1
      3 | 4505 | 20.00016 | 1
      3 | 3802 | 9.804 | 1
      3 | 696 | 15.6864 | 1
(10 rows)

si1=# DELETE FROM orderdetail WHERE orderid = 3 and prod_id = 3215;
DELETE 1
si1=# SELECT * FROM orderdetail WHERE orderid = 3;
 orderid | prod_id | price | quantity
-----+-----+-----+-----
      3 | 4256 | 12.7452 | 1
      3 | 4505 | 20.00016 | 1
      3 | 3777 | 12.7452 | 1
      3 | 1467 | 20.00016 | 1
      3 | 4794 | 9.804 | 1
      3 | 1766 | 17.6472 | 1
      3 | 268 | 17.6472 | 1
      3 | 3802 | 9.804 | 1
      3 | 696 | 15.6864 | 1
(9 rows)

si1=# SELECT * FROM orders WHERE orderid = 3;
 orderid | orderdate | netamount | tax | totalamount | status
-----+-----+-----+-----+-----+-----
```

```
hey@hey: ~/Desktop/practicas/Sl/p3
*=
si1=# SELECT * FROM orders WHERE orderid = 3;
orderid | orderdate | netamount | tax | totalamount | status
-----+-----+-----+-----+-----+-----
3 | 2017-09-11 | 136.07952 | 18 | 160.5738336 | Paid
(1 row)

si1=# UPDATE orderdetail SET quantity = 2 WHERE orderid = 3 and prod_id = 4794;
UPDATE 1
si1=# SELECT * FROM orders WHERE orderid = 3;
orderid | orderdate | netamount | tax | totalamount | status
-----+-----+-----+-----+-----+-----
3 | 2017-09-11 | 145.88352 | 18 | 172.1425536 | Paid
(1 row)

si1=# SELECT * FROM orderdetail WHERE orderid = 3;
orderid | prod_id | price | quantity
-----+-----+-----+-----
3 | 4794 | 9.804 | 2
3 | 1766 | 17.6472 | 1
3 | 1467 | 20.00016 | 1
3 | 4256 | 12.7452 | 1
3 | 3777 | 12.7452 | 1
3 | 4505 | 20.00016 | 1
3 | 696 | 15.6864 | 1
3 | 268 | 17.6472 | 1
3 | 3802 | 9.804 | 1
(9 rows)

si1=# INSERT INTO orderdetail VALUES (3, 3215, 22.35312, 1);
INSERT 0 1
si1=# SELECT * FROM orderdetail WHERE orderid = 3;
orderid | prod_id | price | quantity
-----+-----+-----+-----
3 | 4794 | 9.804 | 2
3 | 3215 | 22.35312 | 1
3 | 3777 | 12.7452 | 1
3 | 4256 | 12.7452 | 1
3 | 1766 | 17.6472 | 1
3 | 1467 | 20.00016 | 1
3 | 268 | 17.6472 | 1
3 | 4505 | 20.00016 | 1
```

```
hey@hey: ~/Desktop/practicas/Sl/p3
3 | 2017-09-11 | 145.88352 | 18 | 172.1425536 | Paid
(1 row)

si1=# SELECT * FROM orderdetail WHERE orderid = 3;
orderid | prod_id | price | quantity
-----+-----+-----+-----
3 | 4794 | 9.804 | 2
3 | 1766 | 17.6472 | 1
3 | 1467 | 20.00016 | 1
3 | 4256 | 12.7452 | 1
3 | 3777 | 12.7452 | 1
3 | 4505 | 20.00016 | 1
3 | 696 | 15.6864 | 1
3 | 268 | 17.6472 | 1
3 | 3802 | 9.804 | 1
(9 rows)

si1=# INSERT INTO orderdetail VALUES (3, 3215, 22.35312, 1);
INSERT 0 1
si1=# SELECT * FROM orderdetail WHERE orderid = 3;
orderid | prod_id | price | quantity
-----+-----+-----+-----
3 | 4794 | 9.804 | 2
3 | 3215 | 22.35312 | 1
3 | 3777 | 12.7452 | 1
3 | 4256 | 12.7452 | 1
3 | 1766 | 17.6472 | 1
3 | 1467 | 20.00016 | 1
3 | 268 | 17.6472 | 1
3 | 4505 | 20.00016 | 1
3 | 3802 | 9.804 | 1
3 | 696 | 15.6864 | 1
(10 rows)

si1=# SELECT * FROM orders WHERE orderid = 3;
orderid | orderdate | netamount | tax | totalamount | status
-----+-----+-----+-----+-----+-----
3 | 2017-09-11 | 168.23664 | 18 | 198.5192352 | Paid
(1 row)

si1=#
```

H. updInventory.sql

```
hey@hey: ~/Desktop/practicas/SI/p3
hey@hey:~/Desktop/practicas/SI/p3$ psql -U alumnodb -h localhost -d si1 -f updInventory.sql
Password for user alumnodb:
psql:updInventory.sql:1: NOTICE: function update_inventory_aux() does not exist, skipping
DROP FUNCTION
CREATE FUNCTION
psql:updInventory.sql:41: NOTICE: function update_inventory() does not exist, skipping
DROP FUNCTION
CREATE FUNCTION
psql:updInventory.sql:62: NOTICE: trigger "upd_inventory" for relation "orders" does not exist, skipping
DROP TRIGGER
CREATE TRIGGER
hey@hey:~/Desktop/practicas/SI/p3$ psql -U alumnodb -h localhost si1
Password for user alumnodb:
psql (10.6 (Ubuntu 10.6-0ubuntu0.18.10.1))
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, bits: 256, compression: off)
Type "help" for help.

si1=# SELECT * FROM orderdetail WHERE orderid = 3;
 orderid | prod_id | price | quantity
-----+-----+-----+-----
      3 | 4794 | 9.804 | 2
      3 | 3215 | 22.35312 | 1
      3 | 3777 | 12.7452 | 1
      3 | 4256 | 12.7452 | 1
      3 | 1467 | 20.00016 | 1
      3 | 696 | 15.6864 | 1
      3 | 1766 | 17.6472 | 1
      3 | 4505 | 20.00016 | 1
      3 | 268 | 17.6472 | 1
      3 | 3802 | 9.804 | 1
(10 rows)

si1=# SELECT * FROM orders WHERE orderid = 3;
 orderid | orderdate | netamount | tax | totalamount | status
-----+-----+-----+-----+-----+-----
      3 | 2017-09-11 | 168.23664 | 18 | 198.5192352 | Paid
(1 row)

si1=# SELECT * FROM alerts;
 prod_id | required_stock
-----+-----
(0 rows)
```

```
hey@hey: ~/Desktop/practicas/SI/p3

      3 | 4505 | 20.00016 | 1
      3 | 268 | 17.6472 | 1
      3 | 3802 | 9.804 | 1
(10 rows)

si1=# SELECT * FROM orders WHERE orderid = 3;
 orderid | orderdate | netamount | tax | totalamount | status
-----+-----+-----+-----+-----+-----
      3 | 2017-09-11 | 168.23664 | 18 | 198.5192352 | Paid
(1 row)

si1=# SELECT * FROM alerts;
 prod_id | required_stock
-----+-----
(0 rows)

si1=# SELECT inventory.prod_id, stock FROM inventory, orderdetail WHERE orderid = 3 and inventory.prod_id = orderdetail.prod_id;
 prod_id | stock
-----+-----
      4794 | 307
      268 | 917
      3777 | 42
      1467 | 423
      4256 | 111
      1766 | 767
      4505 | 0
      3802 | 83
      696 | 618
(9 rows)

si1=# UPDATE orders SET status = NULL where orderid = 3;
UPDATE 1
si1=# UPDATE orders SET status = 'Paid' where orderid = 3;
UPDATE 1
si1=# SELECT * FROM alerts;
 prod_id | required_stock
-----+-----
      4505 | 1
(1 row)

si1=#
```