

Last year's SQL test 1

For each of the following tasks, write the appropriate SQL commands. Load the `tpch-keys.sql` file into your database.

Task 1 List the order numbers (`orderkey`) with the order date (`orderdate`) and order priority (`orderpriority`) for which any item (`lineitem`) was shipped (`shipdate`) more than 120 days after the order date. Include only orders placed in August of any year with a priority of `'2-HIGH'` or `'1-URGENT'`. Sort the results by priority (first `'1-URGENT'`), secondly by order date in descending order, and thirdly by order number in ascending order.

Solution

```
SELECT DISTINCT o_orderkey, o_orderdate, o_orderpriority
  FROM orders
  JOIN lineitem ON l_orderkey = o_orderkey
  WHERE l_shipdate > o_orderdate + 120
        AND o_orderpriority < '3'
        AND EXTRACT (month FROM o_orderdate) = 8
 ORDER BY o_orderpriority ASC, o_orderdate DESC, o_orderkey ASC;
```

The query returns 139 tuples.

Task 2 List the order numbers (`orderkey`) that consist of more than 1 item (`lineitem`), and for which all items were delivered in the same way (`shipmode`). Sort the results in ascending order.

Solution

```
(
SELECT DISTINCT l1.l_orderkey
  FROM lineitem l1
  JOIN lineitem l2 ON l1.l_orderkey = l2.l_orderkey
  WHERE l1.l_linenumber <> l2.l_linenumber
)
EXCEPT
(
SELECT l1.l_orderkey
  FROM lineitem l1
  JOIN lineitem l2 on l1.l_orderkey=l2.l_orderkey
  WHERE l1.l_shipmode <> l2.l_shipmode
)
ORDER BY 1;
```

The query returns 3623 numbers, our solution uses **EXCEPT** and two simple **SELECT** expressions.

- Task 3**
- Add a foreign key constraint to the **regionkey** column of the **nation** table referencing the **regionkey** column of the **region** table, and set **ON DELETE** to delete all countries when a continent is deleted.
 - Add one tuple to both of the above tables representing Australia as a country and as a continent, respectively.
 - Remove the newly added continent from the **region** table. Check with a **SELECT** query if the corresponding tuple has disappeared from the **nation** table.

Solution

```
ALTER TABLE nation
  ADD CONSTRAINT fk_nation_region
  FOREIGN KEY (n_regionkey) REFERENCES region(r_regionkey)
  ON DELETE CASCADE;
```

```
INSERT INTO region VALUES (666, 'AUSTRALIA', NULL);
INSERT INTO nation VALUES (2137, 'AUSTRALIA', 666, NULL);
```

```
DELETE FROM region WHERE r_name = 'AUSTRALIA';
SELECT COUNT(*) FROM nation WHERE n_name = 'AUSTRALIA';
```

- Task 4** List the numbers of all customers (**custkey**) from the **customer** table who have not placed any orders (**orders**). Sort the results in ascending order.

Solution

```
SELECT c_custkey
FROM customer
LEFT JOIN orders ON c_custkey = o_custkey
WHERE o_orderkey IS NULL
ORDER BY 1;
```

The query returns 5000 numbers.

- Task 5** Add a 10% bonus to the account balances (**acctbal**) of all European customers in the **customer** table.

Solution

```
UPDATE customer
  SET c_acctbal = c_acctbal * 1.1
  FROM nation
  JOIN region ON n_regionkey = r_regionkey
  WHERE c_nationkey = n_nationkey
  AND r_name = 'EUROPE';
```

The query updates 2968 tuples.