

Databases

Practice #2 - Oracle SQLPLUS

Practice objective

Write some SQL queries on an Oracle database.

1. Description of the *Delivery* database

The Delivery database gathers information about the activities of a firm delivering and collecting goods for various customer companies.

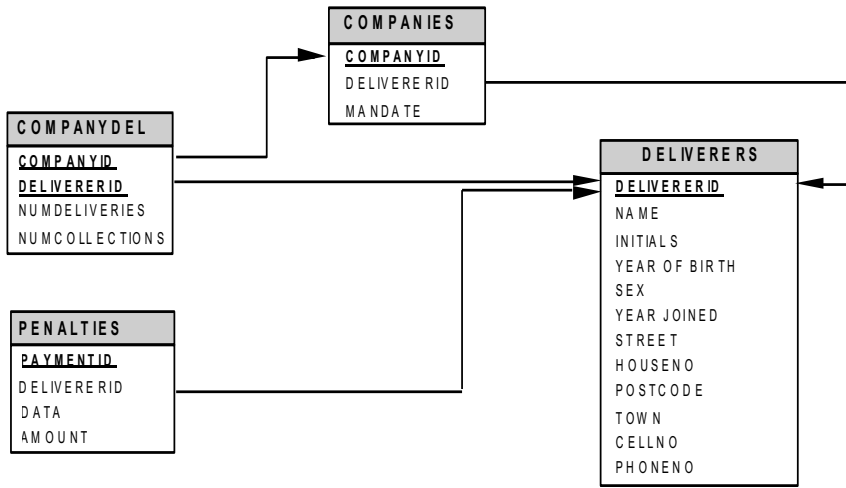
The DELIVERERS table contains the personal data for the deliverers working at the firm. For each deliverer, the following information is available: identification code (DELIVERERID), last name, first name initials, year of birth, sex, year when she/he began working for the firm, street, house number, city, residence postal code, cellular phone number, and office phone number.

The COMPANIES table reports, for each customer company, the company identification code (CompanyID) and the identification code of the deliverer who is the company's current reference person. In addition, it reports the number of times (MANDATE) the deliverer held this position.

The COMPANYDEL table reports the total number of good deliveries (NUMDELIVERIES) and collections (NUMCOLLECTIONS) made by each deliverer for each customer company. Note that the table only reports the deliverer-company pairs such that the deliverer performed at least one delivery or collection for the company.

The PENALTIES table reports the fines received by each deliverer. For each fine, the fine code (PENALTYID), the deliverer code, the fine date, and amount to be paid are stored.

The database schema is shown in the subsequent figure. Next Section 2 reports the table instance.



2. Table instance for the *Delivery* database

The primary key is underlined. Optional attributes are denoted with *.

DELIVERERS table

<u>DELIVERERID</u>	NAME	INITIALS	YEAR_OF_BIRTH	SEX	YEAR JOINED	STREET	HOUSENO	POSTCODE	TOWN	CELLNO	PHONENO*
2	Everett	R	1948	M	1975	Stoney Road	43	3575NH	Stratford	070-237893	2411
6	Parmenter	R	1964	M	1977	Haseltine Lane	80	1234KK	Stratford	070-476537	8467
7	Wise	GWS	1963	M	1981	Edgecombe Way	39	9758VB	Stratford	070-347689	NULL
8	Newcastle	B	1962	F	1980	Station Road	4	6584WO	Inglewood	070-476573	2983
27	Collins	DD	1964	F	1983	Long Drive	804	8457DK	Eltham	079-234857	2513
28	Collins	C	1963	F	1983	Old main Road	10	1294QK	Midhurst	010-659599	NULL
39	Bishop	D	1956	M	1980	Eaton Square	78	9629CD	Stratford	070-393435	NULL
44	Baker	E	1963	M	1980	Lewis Street	23	4444LJ	Inglewood	070-368753	1124
57	Brown	M	1971	M	1985	Edgecombe Way	16	4377CB	Stratford	070-473458	6409
83	Hope	PK	1956	M	1982	Magdalene Road	16a	1812UP	Stratford	070-353548	1608
95	Miller	P	1934	M	1972	High Street	33a	5746OP	Douglas	070-867564	NULL
100	Parmenter	P	1963	M	1979	Haseltine Lane	80	1234KK	Stratford	070-476537	6524
104	Moorman	D	1970	F	1984	Stout Street	65	9437AO	Eltham	079-987571	7060
112	Bailey	IP	1963	F	1984	Vixen Road	8	6392LK	Plymouth	010-54874	1319

COMPANYDEL table

<u>COMPANYID</u>	<u>DELIVERERID</u>	NUMDELIVERIES	NUMCOLLECTIONS
1	2	4	8
1	6	9	1
1	8	0	1
1	44	7	5
1	57	5	0
1	83	3	3
2	8	4	4
2	27	11	2
2	104	8	4
2	112	4	8

Tabella **PENALTIES**

<u>PAYMENTID</u>	DELIVERER ID	DATA	AMOUNT
1	6	12/08/1980	100
2	44	05/05/1981	75
3	27	10/09/1983	100
4	104	08/12/1984	50
5	44	08/12/1980	25
6	8	08/12/1980	25
7	44	30/12/1982	30
8	27	12/11/1984	75

COMPANIES table

<u>COMPANYID</u>	DELIVERERID	MANDATE
1	6	first
2	27	second

3. SQL Queries

1. Find the identification codes, the names and the initials (attribute INITIALS) of the deliverers that have never been fined.
2. Find the identification codes of all deliverers that have received at least one 25-Euro fine and at least one 30-Euro fine.
3. Find the identification codes and the names of the deliverers who have received more than one fine on the same date.
4. Find the identification codes of the deliverers that have serviced requests from *all* of the firms in table COMPANIES (N.B. A deliverer has serviced a request from a firm if he/she has delivered/collected parcels to/from the firm at least once).
5. Find the identification codes of the deliverers who have delivered (or collected) parcels to (from) at least one firm where deliverer no. 57 has delivered or collected parcels.
6. Find the identification codes and the names of the deliverers whose number of fines received in 1980¹ is greater than the number of fines received in 1981 (by the same deliverer).
7. Find the identification code of the deliverer who has received the highest number of fines.
8. Find the identification codes of the deliverers who have delivered (or collected) parcels to (from) *all* of the firms in which deliverer no. 57 has delivered or collected parcels.
9. Find the identification codes of the deliverers who have *only* delivered (or collected) parcels to (from) firms in which deliverer no. 57 has delivered or collected parcels.
10. Find the identification codes of the deliverers who have delivered (or collected) parcels to (from) *all* of the firms in which deliverer no. 57 has delivered or collected parcels, and *only* to (from) such firms (i.e., to/from no other firms than those visited by deliverer no. 57).

¹ In Oracle, dates can be expressed using the TO_DATE function, which allows specifying both the date and the format used to represent it. For example, to require that the date (i.e., attribute Data) is equal to 8 December 1980, the condition DATA = TO_DATE('08/12/1980','DD/MM/YYYY') should be specified in the WHERE clause of the query.

4. Solutions

1. Find the identification codes, the names and the initials (attribute INITIALS) of the deliverers that have never been fined.

```
SELECT DELIVERERID, NAME, INITIALS
FROM DELIVERERS
WHERE DELIVERERID NOT IN
  (SELECT DELIVERERID
   FROM PENALTIES);
```

or

```
SELECT DELIVERERID, NAME, INITIALS
FROM DELIVERERS D
WHERE NOT EXISTS
  (SELECT * FROM PENALTIES P
   WHERE P.DELIVERERID=D.DELIVERERID);
```

2. Find the identification codes of all deliverers that have received at least one 25-Euro fine and at least one 30-Euro fine.

```
SELECT DISTINCT DELIVERERID
FROM PENALTIES
WHERE AMOUNT=25
AND DELIVERERID IN
  (SELECT DELIVERERID FROM PENALTIES
   WHERE AMOUNT=30);
```

or

```
SELECT DELIVERERID
FROM DELIVERERS
WHERE DELIVERERID IN
  (SELECT DELIVERERID
   FROM PENALTIES
   WHERE AMOUNT=25)
AND DELIVERERID IN
  (SELECT DELIVERERID
   FROM PENALTIES
   WHERE AMOUNT=30);
```

3. Find the identification codes and the names of the deliverers who have received more than one fine on the same date.

```
SELECT DISTINCT DELIVERERS.DELIVERERID , NAME
FROM DELIVERERS, PENALTIES
WHERE DELIVERERS.DELIVERERID = PENALTIES.DELIVERERID
GROUP BY DELIVERERS.DELIVERERID, DATA, NAME
HAVING COUNT(*)>1;
```

4. Find the identification codes of the deliverers that have serviced requests from *all* of the firms in table COMPANIES (N.B. A deliverer has serviced a request from a firm if he/she has delivered/collected parcels to/from the firm at least once).

```
SELECT DELIVERERID
FROM COMPANYDEL
GROUP BY DELIVERERID
HAVING COUNT(*)=(SELECT COUNT(*) FROM COMPANIES);
```

5. Find the identification codes of the deliverers who have delivered (or collected) parcels to (from) at least one firm where deliverer no. 57 has delivered or collected parcels.

```
SELECT DISTINCT DELIVERERID
FROM COMPANYDEL
WHERE DELIVERERID <> 57
AND COMPANYID IN
(SELECT COMPANYID
FROM COMPANYDEL
WHERE DELIVERERID =57);
```

6. Find the identification codes and the names of the deliverers whose number of fines received in 1980 is greater than the number of fines received in 1981 (by the same deliverer).

```
SELECT D.DELIVERERID, D.NAME
FROM DELIVERERS D, PENALTIES PE1
WHERE D.DELIVERERID =PE1.DELIVERERID
AND DATA>=TO_DATE('01/01/1980', 'DD/MM/YYYY')
AND DATA<=TO_DATE('31/12/1980', 'DD/MM/YYYY')
GROUP BY D.DELIVERERID, D.NAME
HAVING COUNT(*) > (SELECT COUNT(*)
FROM PENALTIES PE2
WHERE PE2. DELIVERERID =D.DELIVERERID
AND DATA>=TO_DATE('01/01/1981', 'DD/MM/YYYY')
AND DATA<=TO_DATE('31/12/1981', 'DD/MM/YYYY')
);
```

7. Find the identification code of the deliverer who has received the highest number of fines.

```
SELECT DELIVERERID
FROM PENALTIES
GROUP BY DELIVERERID
HAVING COUNT(*) = (
SELECT MAX(NumPenalties)
FROM (SELECT DELIVERERID, COUNT(*) AS NumPenalties
FROM PENALTIES
GROUP BY DELIVERERID) TOTMULTEDELIVERERS
);
```

or

```
SELECT DELIVERERID
FROM (SELECT DELIVERERID, COUNT(*) AS NumPenalties
      FROM PENALTIES
      GROUP BY DELIVERERID) TOTMULTEDELIVERERS1
WHERE NumPenalties = (
      SELECT MAX(NumPenalties)
      FROM (SELECT DELIVERERID, COUNT(*) AS NumPenalties
            FROM PENALTIES
            GROUP BY DELIVERERID) TOTMULTEDELIVERERS2
      );
```

8. Find the identification codes of the deliverers who have delivered (or collected) parcels to (from) *all* of the firms in which deliverer no. 57 has delivered or collected parcels.

```
SELECT DELIVERERID
FROM COMPANYDEL
WHERE DELIVERERID <> 57
AND COMPANYID IN
      (SELECT COMPANYID
       FROM COMPANYDEL
       WHERE DELIVERERID=57)
GROUP BY DELIVERERID
HAVING COUNT(*) = (SELECT COUNT(*)
                   FROM COMPANYDEL
                   WHERE DELIVERERID =57)
```

9. Find the identification codes of the deliverers who have *only* delivered (or collected) parcels to (from) firms in which deliverer no. 57 has delivered or collected parcels.

```
SELECT DISTINCT DELIVERERID
FROM COMPANYDEL
WHERE DELIVERERID <> 57
AND DELIVERERID NOT IN
      (SELECT DELIVERERID
       FROM COMPANYDEL
       WHERE COMPANYID NOT IN
             (SELECT COMPANYID
              FROM COMPANYDEL
              WHERE DELIVERERID =57));
```

10. Find the identification codes of the deliverers who have delivered (or collected) parcels to (from) *all* of the firms in which deliverer no. 57 has delivered or collected parcels, and *only* to (from) such firms (i.e., to/from no other firms than those visited by deliverer no. 57).

```
SELECT DELIVERERID
FROM COMPANYDEL
```

```
WHERE DELIVERERID <> 57
AND DELIVERERID NOT IN
  (SELECT DELIVERERID
   FROM COMPANYDEL
   WHERE COMPANYID NOT IN
    (SELECT COMPANYID
     FROM COMPANYDEL
     WHERE DELIVERERID =57))
GROUP BY DELIVERERID
HAVING COUNT(*) = (SELECT COUNT(*)
                   FROM COMPANYDEL
                   WHERE DELIVERERID =57);
```