

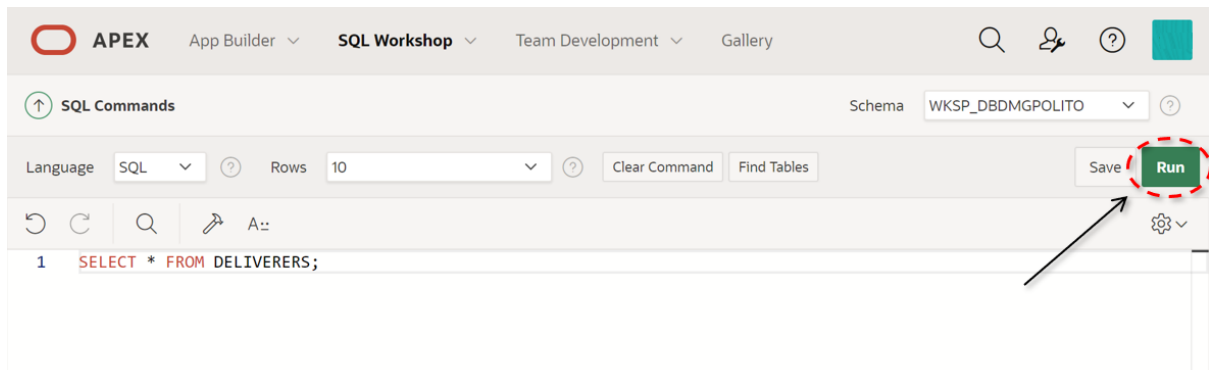
# Introduction to Databases

## Oracle SQLPLUS - Practice n. 1

The objective of this practice is to write some SQL queries and execute them on an Oracle database.

### Write and execute SQL queries

To write the SQL query on Oracle Apex, go to *SQL Workshop* and then *SQL Commands*. Execute it by clicking on the *Run* button (see figure).



## 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.

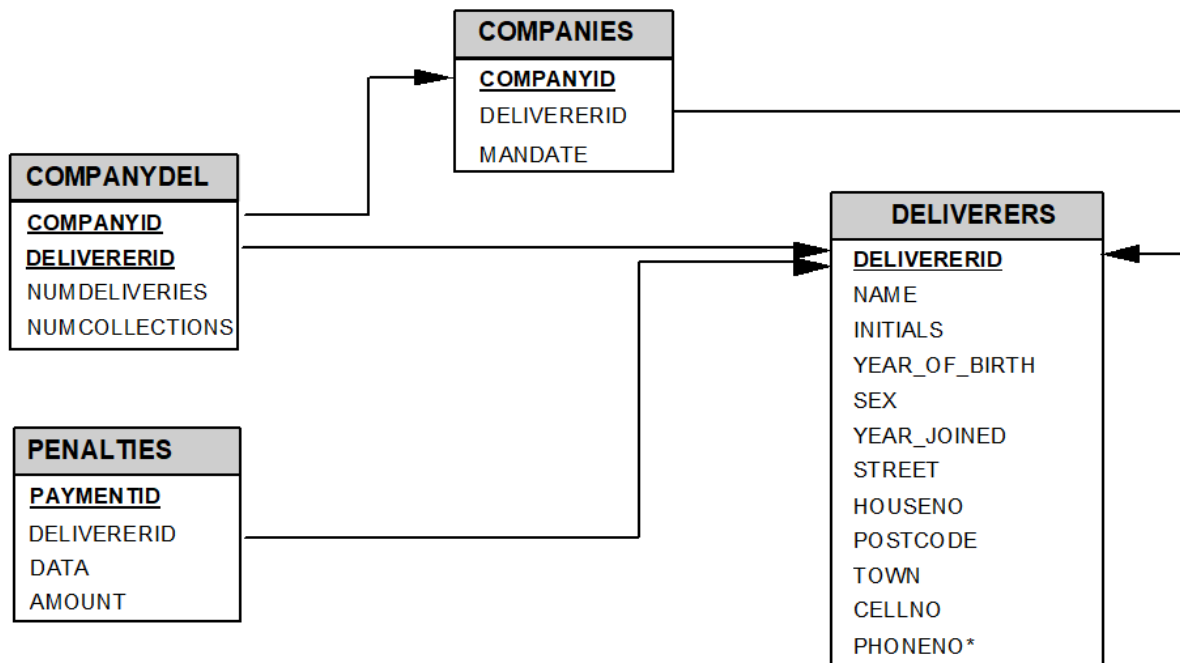
The COMPANIES table reports, for each customer company, the company identification code (COMPANYID) and the identification code of the deliverer who is the company's current reference person. In addition, it reports the number of times (MANDATE) the deliverer held

this position.

The COMPANYDEL table reports the total number of 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. Section 2 reports the details of every table instance.



## 2 Table instances for the *Delivery* database

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

**PENALTIES** table

<u>PAYMENTID</u>	DELIVERERID	DATA	AMOUNT
1	6	12/08/80	100
2	44	05/05/81	75
3	27	10/09/83	100
4	104	08/12/84	50
5	44	08/12/80	25
6	8	08/12/80	25
7	44	30/12/82	30
8	27	12/11/84	75

**COMPANIES** table

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

### 3 SQL Queries

1. Show all information about all deliverers.
2. Show the identification codes of all the companies for which deliverers either delivered or collected goods.
3. For each deliverer whose last name (attribute NAME) starts with the letter 'B', show the deliverer name and the identification code.
4. For each deliverer whose office phone number (attribute PHONENO) is either different from 8467 or not available, show the deliverer name, sex, and identification code.
5. Show the name and city of residence of the deliverers who received at least one fine.
6. For each company reference person who has received at least one fine after 31/12/1980, show the last name and the first name initials (attribute INITIALS). Sort the result in increasing alphabetical order with respect to the last name.
7. For each deliverer living in Stratford, find all companies where the deliverer has made at least two collections and one delivery, showing the results as pairs (deliverer identification code, company identification code).
8. Show the identification codes for the deliverers born after 1962 who have made at least one delivery or collection to a company whose reference person has been appointed for the first time (attribute MANDATE='first'). Sort the result in descending order of identification codes.
9. Show the last name of the deliverers living either in Inglewood or in Stratford who either delivered or collected goods for at least 2 customer companies.
10. For each deliverer living in Inglewood who received at least two fines, show the deliverer identification code and the *total* amount (attribute AMOUNT) of the received fines.
11. For each deliverer who received between 2 and 4 fines (i.e., at least 2 but no more than 4 fines), show the last name and the amount of the smallest fine received.
12. Considering the deliverers not living in Stratford and whose last name (attribute NAME) begins with the letter 'B', show the total number of deliveries and the total number of collections.

## 4 Solutions

1. Show all information about all deliverers.

```
SELECT * FROM DELIVERERS;
```

DELIVERERID	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
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
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
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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
7	Wise	GWS	1963	M	1981	Edgecombe Way	39	9758VB	Stratford	070-347689	(null)
28	Collins	C	1963	F	1983	Old Main Road	10	1294OK	Midhurst	010-659599	(null)
39	Bishop	D	1956	M	1980	Eaton Square	78	9629CD	Stratford	070-393435	(null)
95	Miller	P	1934	M	1972	High Street	33a	5746OP	Douglas	070-867564	(null)

2. Show the identification codes of all the companies for which deliverers either delivered or collected goods.

```
SELECT DISTINCT COMPANYID FROM COMPANYDEL;
```

COMPANYID
1
2

3. For each deliverer whose last name (attribute NAME) starts with the letter 'B', show the deliverer name and the identification code.

```
SELECT NAME, DELIVERERID
FROM DELIVERERS
WHERE NAME LIKE 'B%';
```

NAME	DELIVERERID
Baker	44
Brown	57
Bailey	112
Bishop	39

4. For each deliverer whose office phone number (attribute PHONENO) is either different from 8467 or not available, show the deliverer name, sex, and identification code.

```
SELECT NAME, SEX, DELIVERERID
FROM DELIVERERS
WHERE PHONENO <> 8467 OR PHONENO IS NULL;
```

NAME	SEX	DELIVERERID
Everett	M	2
Newcastle	F	8
Collins	F	27
Baker	M	44
Brown	M	57
Hope	M	83
Parmenter	M	100
Moorman	F	104
Bailey	F	112
Wise	M	7
Collins	F	28
Bishop	M	39
Miller	M	95

5. Show the name and city of residence of the deliverers who received at least one fine.

```
SELECT DISTINCT NAME, TOWN
FROM DELIVERERS D, PENALTIES P
WHERE D.DELIVERERID = P.DELIVERERID;
```

NAME	TOWN
Baker	Inglewood
Parmenter	Stratford
Moorman	Eltham
Newcastle	Inglewood
Collins	Eltham

6. For each company reference person who has received at least one fine after 31/12/1980, show the last name and the first name initials (attribute INITIALS). Sort the result in increasing alphabetical order with respect to the last name.

```
SELECT DISTINCT NAME, INITIALS
FROM DELIVERERS D, PENALTIES P, COMPANIES C
WHERE D.DELIVERERID = P.DELIVERERID AND C.DELIVERERID = P.DELIVERERID
AND DATA > TO_DATE('31/12/1980', 'DD/MM/YYYY')
ORDER BY NAME;
```

NAME	INITIALS
Collins	DD

7. For each deliverer living in Stratford, find all companies where the deliverer has made at least two collections and one delivery, showing the results as pairs (deliverer identification code, company identification code).

```
SELECT COMPANYID, D.DELIVERERID
FROM DELIVERERS D, COMPANYDEL C
```

```
WHERE D.DELIVERERID = C.DELIVERERID
AND TOWN = 'Stratford'
AND NUMCOLLECTIONS >= 2 AND NUMDELIVERIES >= 1;
```

COMPANYID	DELIVERERID
1	2
1	83

8. Show the identification codes for the deliverers born after 1962 who have made at least one delivery or collection to a company whose reference person has been appointed for the first time (attribute MANDATE='first'). Sort the result in descending order of identification codes.

```
SELECT DISTINCT D.DELIVERERID
FROM DELIVERERS D, COMPANYDEL C, COMPANIES CO
WHERE D.DELIVERERID = C.DELIVERERID AND CO.COMPANYID = C.COMPANYID
AND YEAR_OF_BIRTH > 1962 AND MANDATE = 'first'
ORDER BY D.DELIVERERID DESC;
```

DELIVERERID
57
44
6

9. Show the last name of the deliverers living either in Inglewood or in Stratford who either delivered or collected goods for at least 2 customer companies.

```
SELECT DISTINCT NAME
FROM DELIVERERS D, COMPANYDEL C
WHERE D.DELIVERERID = C.DELIVERERID
AND (TOWN = 'Stratford' OR TOWN = 'Inglewood')
GROUP BY D.DELIVERERID, NAME
HAVING COUNT(*) > 1;
```

NAME
Newcastle

10. For each deliverer living in Inglewood who received at least two fines, show the deliverer identification code and the *total* amount (attribute AMOUNT) of the received fines.

```
SELECT D.DELIVERERID, SUM(AMOUNT)
FROM DELIVERERS D, PENALTIES P
WHERE D.DELIVERERID = P.DELIVERERID AND TOWN = 'Inglewood'
GROUP BY D.DELIVERERID
HAVING COUNT(*) > 1;
```

DELIVERERID	SUM(AMOUNT)
44	130

11. For each deliverer who received between 2 and 4 fines (i.e., at least 2 but no more than 4 fines), show the last name and the amount of the smallest fine received.

```

SELECT D.NAME, MIN(P.AMOUNT)
FROM DELIVERERS D, PENALTIES P
WHERE D.DELIVERERID = P.DELIVERERID
GROUP BY D.DELIVERERID, D.NAME
HAVING COUNT(*) >= 2 AND COUNT(*) <= 4;

```

NAME	MIN(AMOUNT)
Baker	25
Collins	75

12. Considering the deliverers not living in Stratford and whose last name (attribute NAME) begins with the letter 'B', show the total number of deliveries and the total number of collections.

```

SELECT SUM(NUMDELIVERIES), SUM(NUMCOLLECTIONS)
FROM COMPANYDEL C, DELIVERERS D
WHERE C.DELIVERERID = D.DELIVERERID AND TOWN <> 'Stratford'
AND NAME LIKE 'B%';

```

SUM(NUMDELIVERIES)	SUM(NUMCOLLECTIONS)
11	13