ORACLE 10g/11g Practical 1 & 2 (Table creation + Population)

1. Click on start
2. Click on Program
3. Click on Oracle 11g Application Server
4. Click on Application Developer then select SQLPLUS
5. Enter your username, password and hoststring which is 'oraclass_ra'(Lab G 1.2)
6. Create and populate the following tables:

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	DEPTNO
7369	SMITH	CLERK	7902	17-Dec-80	800	20
7499	ALLEN	SALESMAN	7698	20-Feb-81	1600	30
7521	WARD	SALESMAN	7698	22-Feb-81	1250	30
7698	BLAKE	MANAGER		1-May-81	3850	30
7902	FORD	ANALYST	7566	3-Dec-81	3000	10

Use the following data types to create the table structure:

```
CREATE TABLE EMP(
        EMPNO       number(4) NOT NULL,
        ENAME       varchar(30) NOT NULL,
        JOB         char(10),
        MGR         number(4),
        HIREDATE    date,
        SAL         number(7,2),
        DEPTNO      number(2)
                    );
```

The SQL statement to populate (insert) data into the table is as follows:

(N.B. It is best to write all your coding in a word editing software (Notepad, MS Word), save the file and you can just copy and paste from here into SQLPLUS; It is also easier to modify your coding here rather than doing it directly in SQLPLUS which is DOS Based!)

First try these incorrect SQL commands and see for yourself the error displayed by SQLPLUS

INSERT INTO EMP VALUES (7369, 'SMITH', 'CLERK', 7902, '17-DEC-80', 800, 20)

```
SQL> INSERT INTO EMP
  2  VALUES (7369, 'SMITH', 'CLERK', 7902, '17-DEC-80', 800, 20)
  3
SQL>
```

What you missed out here is the semi colon (;) at the end!

INSERT INTO EMP VALUES (7369, SMITH, 'CLERK', 7902, '17-DEC-80', 800, 20);

```
SQL> INSERT INTO EMP
  2  VALUES (7369, SMITH, 'CLERK', 7902, '17-DEC-80', 800, 20);
VALUES (7369, SMITH, 'CLERK', 7902, '17-DEC-80', 800, 20)
          *
```

ERROR at line 2:
ORA-00984: column not allowed here

The correct syntax is as follows:
INSERT INTO EMP VALUES (7369, ‘SMITH’, ‘CLERK’, 7902, ‘17-DEC-80’, 800, 20);

SQL> INSERT INTO EMP VALUES (7902, 'FORD', 'ANALYST', 7576, '3-DEC-81', 3000, 10);

1 row created.

Similarly write SQL statements to insert the rest of the data into the EMP table.
(N.B. You can send a series of SQL at one go)

INSERT INTO EMP VALUES (7499, ‘ALLEN’, ‘SALESMAN’, 7698, ‘20-FEB-81’, 1600, 30);
INSERT INTO EMP VALUES (7521, ‘WARD’, ‘SALESMAN’, 7698, ‘22-FEB-81’, 1250, 30);
INSERT INTO EMP VALUES (7698, ‘BLAKE’, ‘MANAGER’, , ‘1-MAY-81’, 3850, 30);
INSERT INTO EMP VALUES (7902, ‘FORD’, ‘ANALYST’, 7576, ‘3-DEC-81’, 3000, 10);

You will encounter a problem for the null value for ‘Blake’

SQL> INSERT INTO EMP VALUES (7499, 'ALLEN', 'SALESMAN', 7698, '20-FEB-81', 1600, 30);

1 row created.

SQL> INSERT INTO EMP VALUES (7521, 'WARD', 'SALESMAN', 7698, '22-FEB-81', 1250, 30);

1 row created.

SQL> INSERT INTO EMP VALUES (7698, 'BLAKE', 'MANAGER', , '1-MAY-81', 3850, 30);
INSERT INTO EMP VALUES (7698, 'BLAKE', 'MANAGER', , '1-MAY-81', 3850, 30)
*
ERROR at line 1:
ORA-00936: missing expression

SQL> INSERT INTO EMP VALUES (7902, 'FORD', 'ANALYST', 7576, '3-DEC-81', 3000, 10);

1 row created.

The correct way to do it is as follows:

INSERT INTO EMP VALUES (7698, ‘BLAKE’, ‘MANAGER’,’’ , ‘1-MAY-81’, 3850, 30);

SQL> INSERT INTO EMP VALUES (7698, 'BLAKE', 'MANAGER'," , '1-MAY-81', 3850, 30);

1 row created.

Finally try:

1. SELECT * FROM EMP;

SQL> select * from emp;

EMPNO	ENAME	JOB	MGR	HIREDATE

```
      SAL     DEPTNO
---------- ----------
      7369 SMITH                 CLERK          7902 17-DEC-80
       800         20

      7499 ALLEN                 SALESMAN       7698 20-FEB-81
      1600         30

      7521 WARD                  SALESMAN       7698 22-FEB-81
      1250         30


    EMPNO ENAME                      JOB              MGR HIREDATE
---------- ------------------------------ ---------- ---------- ---------
      SAL     DEPTNO
---------- ----------
      7902 FORD                  ANALYST        7576 03-DEC-81
      3000         10

      7698 BLAKE                 MANAGER             01-MAY-81
      3850         30
```

2. SELECT ENAME FROM EMP;

```
SQL> select ename from emp;

ENAME
------------------------------
SMITH
ALLEN
WARD
FORD
BLAKE
```

3. SELECT ENAME,JOB FROM EMP;

```
SQL> select ename, job from emp;

ENAME                          JOB
------------------------------ ----------
SMITH                         CLERK
ALLEN                          SALESMAN
WARD                           SALESMAN
FORD                          ANALYST
BLAKE                          MANAGER
```

PRACTICAL 2 ON 10g/11g SQLPlus

FIRST CHANGE YOUR PASSWORD BY USING THE FOLLOWING COMMAND:

SO, CONNECT TO ORACLE WITH YOUR USUAL USERNAME AND PASSWORD GIVEN TO YOU THEN CHANGE YOUR PASSWORD AS FOLLOWS:

ALTER USER <USERNAME> IDENTIFIED BY <NEWPASSWORD>;

1. Create the following tables

Table: DEPT

DEPTNO	DNAME	LOC
10	STORE	CHICAGO
20	RESEARCH	DALLAS
30	SALES	NEW YORK
40	MARKETING	BOSTON

Table: SALGRADE

GRADE	LOSAL	HISAL
1	700	1200
2	1201	1400
3	1401	2000
4	2001	3000
5	3001	9999

2. SELECT LOC, DEPTNO
FROM DEPT;

```
1. SQL> SELECT LOC, DEPTNO
2.   2  FROM DEPT;

LOC                DEPTNO
------------------ ----------
CHICAGO                10
DALLAS                 20
NEW YORK               30
BOSTON                 40
```

SELECT ENAME, DEPTNO, SAL * 1.55
FROM EMP;

```
SQL> SELECT ENAME, DEPTNO, SAL * 1.55
  2  FROM EMP;

ENAME                          DEPTNO   SAL*1.55
------------------------------ ---------- ----------
```

```
SMITH                          20       1240
ALLEN                          30       2480
WARD                           30     1937.5
FORD                           10       4650
BLAKE                          30     5967.5
```

```
SELECT ENAME, DEPTNO, HIREDATE
FROM EMP
ORDER BY DEPTNO;
```

```
SQL> SELECT ENAME, DEPTNO, HIREDATE
  2  FROM EMP
  3  ORDER BY DEPTNO;

ENAME                          DEPTNO HIREDATE
------------------------------ ---------- ---------
FORD                               10 03-DEC-81
SMITH                              20 17-DEC-80
ALLEN                              30 20-FEB-81
BLAKE                              30 01-MAY-81
WARD                               30 22-FEB-81
```

```
SELECT ENAME, DEPTNO, HIREDATE
FROM EMP
ORDER BY HIREDATE DESC;
```

```
SQL> SELECT ENAME, DEPTNO, HIREDATE
  2  FROM EMP
  3  ORDER BY HIREDATE DESC;

ENAME                          DEPTNO HIREDATE
------------------------------ ---------- ---------
FORD                               10 03-DEC-81
BLAKE                              30 01-MAY-81
WARD                               30 22-FEB-81
ALLEN                              30 20-FEB-81
SMITH                              20 17-DEC-80
```

```
SELECT JOB, SAL
FROM EMP
WHERE (MGR = 7698 OR MGR = 7566);
```

```
SQL> SELECT JOB, SAL
  2  FROM EMP
  3  WHERE (MGR = 7698 OR MGR = 7566);

JOB              SAL
---------- ----------
SALESMAN         1600
SALESMAN         1250
```

```
SELECT JOB, SAL
FROM EMP
```

```
WHERE SAL >1500;

SQL> SELECT JOB, SAL
  2  FROM EMP
  3  WHERE SAL >1500;

JOB              SAL
---------- ----------
SALESMAN         1600
ANALYST          3000
MANAGER          3850

SELECT JOB, SAL
FROM EMP
WHERE (MGR = 7698 OR MGR = 7566) AND SAL >1500;

SQL> SELECT JOB, SAL
  2  FROM EMP
  3  WHERE (MGR = 7698 OR MGR = 7566) AND SAL >1500;

JOB              SAL
---------- ----------
SALESMAN         1600

SELECT EMPNO, ENAME, SAL
FROM EMP
WHERE SAL BETWEEN 1500 AND 2500;

SQL> SELECT EMPNO, ENAME, SAL
  2  FROM EMP
  3  WHERE SAL BETWEEN 1500 AND 2500;

     EMPNO ENAME                          SAL
---------- ------------------------------ ----------
      7499 ALLEN                        1600


SELECT ENAME
FROM EMP
WHERE HIREDATE BETWEEN '02-APR-81' AND '08-SEP-81';



SQL> SELECT ENAME
  2  FROM EMP
  3  WHERE HIREDATE BETWEEN '02-APR-81' AND '08-SEP-81';

ENAME
------------------------------
BLAKE

SQL> SELECT LOC, DEPTNO
  2  FROM DEPT
```

```
  3  WHERE LOC LIKE '%C%C%';

LOC                DEPTNO
------------------- ----------
CHICAGO                 10
```

```
update EMP set
JOB = 'MANAGER', DEPTNO = 10, SAL = SAL +2000
where ENAME = 'FORD';

SQL> set linesize 120;
SQL> select * from emp;

    EMPNO ENAME                JOB              MGR HIREDATE         SAL     DEPTNO
---------- ------------------------------ --------- ---------- --------- ---------- ----------
     7369 SMITH                CLERK           7902 17-DEC-80        800         20
     7499 ALLEN                SALESMAN        7698 20-FEB-81       1600         30
     7521 WARD                 SALESMAN        7698 22-FEB-81       1250         30
     7902 FORD                 MANAGER         7576 03-DEC-81       5000         10
     7698 BLAKE                MANAGER              01-MAY-81      3850         30
```

All employees working in the departments 10 and 30 get a 15% salary increase.

```
update EMP
set SAL = SAL * 1.15
where DEPTNO in (10,30);

SQL> update EMP
  2  set SAL = SAL * 1.15
  3  where DEPTNO in (10,30);

4 rows updated.

SQL> SELECT * FROM EMP;

    EMPNO ENAME                JOB              MGR HIREDATE         SAL     DEPTNO
---------- ------------------------------ --------- ---------- --------- ---------- ----------
     7369 SMITH                CLERK           7902 17-DEC-80        800         20
     7499 ALLEN                SALESMAN        7698 20-FEB-81       1840         30
     7521 WARD                 SALESMAN        7698 22-FEB-81     1437.5         30
     7902 FORD                 MANAGER         7576 03-DEC-81       5750         10
     7698 BLAKE                MANAGER              01-MAY-81     4427.5         30
```

All salesmen working in the department 20 get the same salary as the manager
who has the lowest salary among all managers.

```
update EMP
set SAL = (select min(SAL) from EMP
where JOB = 'MANAGER')
where JOB = 'SALESMAN' and DEPTNO = 30;

SQL> update EMP
  2  set SAL = (select min(SAL) from EMP
```

```
  3  where JOB = 'MANAGER')
  4  where JOB = 'SALESMAN' and DEPTNO = 30;

2 rows updated.

SQL> SELECT * FROM EMP;

    EMPNO ENAME                JOB              MGR HIREDATE         SAL     DEPTNO
---------- ------------------------------ --------- ---------- --------- ---------- ----------
      7369 SMITH                CLERK           7902 17-DEC-80       800         20
      7499 ALLEN                SALESMAN        7698 20-FEB-81    4427.5         30
      7521 WARD                 SALESMAN        7698 22-FEB-81    4427.5         30
      7902 FORD                 MANAGER         7576 03-DEC-81      5750         10
      7698 BLAKE                MANAGER              01-MAY-81    4427.5         30
```

JOINING RELATIONS (TABLES)

```
select ENAME, E.DEPTNO, DNAME
from EMP E, DEPT D
where E.DEPTNO = D.DEPTNO
and JOB = 'SALESMAN';

SQL> select ENAME, E.DEPTNO, DNAME
  2  from EMP E, DEPT D
  3  where E.DEPTNO = D.DEPTNO
  4  and JOB = 'SALESMAN';

ENAME                      DEPTNO DNAME
------------------------------ ---------- --------------
ALLEN                          30 SALE
WARD                           30 SALE
```

Explanation: E and D are table aliases for EMP and DEPT, respectively. The computation of the query result occurs in the following manner (without optimization):
1. Each row from the table EMP is combined with each row from the table DEPT (this operation is called Cartesian product). If EMP contains m rows and DEPT contains n rows, we thus get n _ m rows.
2. From these rows those that have the same department number are selected (where E.DEPTNO = D.DEPTNO).
3. From this result finally all rows are selected for which the condition JOB = 'SALESMAN' holds.
In this example the joining condition for the two tables is based on the equality operator "=".
The columns compared by this operator are called join columns and the join operation is called an equijoin.

```
CREATE TABLE PROJECT
        (
                PNO             number(5) CONSTRAINT PRJ_PK PRIMARY KEY,
                PNAME                   varchar2(60) UNIQUE,
                PMGR            number(4) NOT NULL,
                PERSONS         number(5),
                BUDGET                  number(8,2) NOT NULL,
                PSTART                  date,
                PEND            date
        );
```

Example: For each project, retrieve its name, the name of its manager, and the name of the department where the manager is working:

```
select ENAME, DNAME, PNAME
from EMP E, DEPT D, PROJECT P
where E.EMPNO = P.PMGR
and D.DEPTNO = E.DEPTNO;
```

```
insert into project values (314,'ELEC',7698,NULL,250000.75,'27-JAN-98',NULL);
insert into project values (315,'WATER',7902,1,500000.75,'14-JUN-00','14-JUN-2007');
```

```
SQL> insert into project values (315,'WATER',7602,1,250000.75,'14-JUN-00','14-JUN-2007');

1 row created.

SQL> insert into project values (315,'WATER',7902,1,500000.75,'14-JUN-00','14-JUN-2007');

1 row created.
```

Example: For each project, retrieve its name, the name of its manager, and the name ofthe department where the manager is working:

```
select ENAME, DNAME, PNAME
from EMP E, DEPT D, PROJECT P
where E.EMPNO = P.PMGR
and D.DEPTNO = E.DEPTNO;
```

```
SQL> select ENAME, DNAME, PNAME
  2  from EMP E, DEPT D, PROJECT P
  3  where E.EMPNO = P.PMGR
  4  and D.DEPTNO = E.DEPTNO;

ENAME                DNAME          PNAME
-------------------------- -------------- --------------------------------------------
FORD                 STORE          WATER
BLAKE                SALE           ELEC
```

It is even possible to join a table with itself:
Example: List the names of all employees together with the name of their manager:

```
SELECT E1.ENAME, E2.ENAME
FROM EMP E1, EMP E2
WHERE E1.MGR = E2.EMPNO;
```

```
SQL> SELECT E1.ENAME, E2.ENAME
  2  FROM EMP E1, EMP E2
  3  WHERE E1.MGR = E2.EMPNO;

ENAME                ENAME
-------------------------- --------------------------
SMITH                FORD
ALLEN                BLAKE
WARD                 BLAKE
```

Explanation: The join columns are MGR for the table E1 and EMPNO for the table E2.
The equijoin comparison is E1.MGR = E2.EMPNO.

List the name and salary of employees of the department 20 who are leadinga project that started before December 31, 1990:

```
select ENAME, SAL
from EMP
where EMPNO IN
(select PMGR from PROJECT
where PSTART < '31-DEC-01')
and DEPTNO =30;
```

```
SQL> select ENAME, SAL
  2  from EMP
  3  where EMPNO IN
  4  (select PMGR from PROJECT
  5  where PSTART < '31-DEC-01')
  6  and DEPTNO =30;

ENAME                          SAL
------------------------------ ----------
BLAKE                        4427.5
```

Explanation: The subquery retrieves the set of those employees who manage a project that started before December 31, 2001. If the employee working in department 30 is contained in this set (in operator), this tuple belongs to the query result set.

```
UPDATE EMP
SET DEPTNO = 40
WHERE DEPTNO = 30 AND EMPNO = 7521;
```

```
SQL> UPDATE EMP
  2  SET DEPTNO = 40
  3  WHERE DEPTNO = 30 AND EMPNO = 7521;

1 row updated.

SQL> SELECT *FROM EMP;

    EMPNO ENAME                    JOB              MGR HIREDATE         SAL     DEPTNO
---------- ------------------------------ ---------- ---------- --------- ---------- ----------
      7369 SMITH                  CLERK           7902 17-DEC-80        800         20
      7499 ALLEN                  SALESMAN        7698 20-FEB-81     4427.5         30
      7521 WARD                   SALESMAN        7698 22-FEB-81     4427.5         40
      7902 FORD                   ANALYST         7576 03-DEC-81       3450         10
      7698 BLAKE                  MANAGER              01-MAY-81     4427.5         30
```

```
select * from EMP
where DEPTNO in
(select DEPTNO from DEPT
```

```
where LOC = 'BOSTON');

SQL> select * from EMP
  2  where DEPTNO in
  3  (select DEPTNO from DEPT
  4  where LOC = 'BOSTON');

    EMPNO ENAME                    JOB           MGR HIREDATE        SAL     DEPTNO
---------- ------------------------------ ---------- ---------- --------- ---------- ----------
     7521 WARD                     SALESMAN        7698 22-FEB-81     4427.5         40
```

List all those employees who are working in the same department as their manager.

```
select * from EMP E1
where DEPTNO in
(select DEPTNO from EMP E
where E.EMPNO = E1.MGR);

SQL> select * from EMP E1
  2  where DEPTNO in
  3  (select DEPTNO from EMP E
  4  where E.EMPNO = E1.MGR);

    EMPNO ENAME                    JOB           MGR HIREDATE        SAL     DEPTNO
---------- ------------------------------ ---------- ---------- --------- ---------- ----------
     7499 ALLEN                    SALESMAN        7698 20-FEB-81     4427.5         30
```

Retrieve all employees who are working in department 30 and who earn at least as much as any (i.e., at least one) employee working in department 10:

```
select * from EMP
where SAL >= any
(select SAL from EMP
where DEPTNO = 10)
and DEPTNO = 30;

SQL> select * from EMP
  2  where SAL >= any
  3  (select SAL from EMP
  4  where DEPTNO = 10)
  5  and DEPTNO = 30;

    EMPNO ENAME                    JOB           MGR HIREDATE        SAL     DEPTNO
---------- ------------------------------ ---------- ---------- --------- ---------- ----------
     7499 ALLEN                    SALESMAN        7698 20-FEB-81     4427.5         30
     7698 BLAKE                    MANAGER           01-MAY-81     4427.5         30
```

List all employees who are not working in department 30 and who earn less than all employees working in department 30:

```
select * from EMP
where SAL < all
```

```
(select SAL from EMP
where DEPTNO = 30)
and DEPTNO <> 30;

SQL> select * from EMP
  2  where SAL < all
  3  (select SAL from EMP
  4  where DEPTNO = 30)
  5  and DEPTNO <> 30;

    EMPNO ENAME                    JOB             MGR HIREDATE        SAL     DEPTNO
---------- ------------------------------ ---------- ---------- --------- ---------- ----------
     7369 SMITH                    CLERK           7902 17-DEC-80       800         20
     7902 FORD                     ANALYST         7576 03-DEC-81      3450         10
```

ANOTHER WAY TO DO THIS IS AS FOLLOWS:

```
select * from EMP
where SAL <
(select MIN(SAL) from EMP
where DEPTNO = 30)
and DEPTNO <> 30;

SQL> select * from EMP
  2  where SAL <
  3  (select MIN(SAL) from EMP
  4  where DEPTNO = 30)
  5  and DEPTNO <> 30;

    EMPNO ENAME                    JOB             MGR HIREDATE        SAL     DEPTNO
---------- ------------------------------ ---------- ---------- --------- ---------- ----------
     7369 SMITH                    CLERK           7902 17-DEC-80       800         20
     7902 FORD                     ANALYST         7576 03-DEC-81      3450         10
```

ADD TWO NEW EMPLOYEES.

```
INSERT INTO EMP VALUES (7269, 'ADAM', 'CLERK', 7901, '17-DEC-82', 900, NULL);
INSERT INTO EMP VALUES (7699, 'JANE', 'PROGRAMMER', NULL, '20-MAR-81', 1600, NULL);

SQL> INSERT INTO EMP VALUES (7269, 'ADAM', 'CLERK', 7901, '17-DEC-82', 900, NULL);

1 row created.

SQL> INSERT INTO EMP VALUES (7699, 'JANE', 'PROGRAMMER', NULL, '20-MAR-81', 1600, NULL);

1 row created.

SQL> SELECT * FROM EMP;

    EMPNO ENAME                    JOB             MGR HIREDATE        SAL     DEPTNO
---------- ------------------------------ ---------- ---------- --------- ---------- ----------
     7269 ADAM                     CLERK           7901 17-DEC-82       900
     7699 JANE                     PROGRAMMER           20-MAR-81      1600
     7369 SMITH                    CLERK           7902 17-DEC-80       800         20
```

```
      7499 ALLEN          SALESMAN        7698 20-FEB-81     4427.5         30
      7521 WARD           SALESMAN        7698 22-FEB-81     4427.5         40
      7902 FORD           ANALYST         7576 03-DEC-81       3450         10
      7698 BLAKE          MANAGER              01-MAY-81     4427.5         30

7 rows selected.
```

List all departments that have no employees:

```
select * from EMP
where not exists
(select * from DEPT
where EMP.DEPTNO = DEPT.DEPTNO);

SQL> select * from EMP
  2  where not exists
  3  (select * from DEPT
  4  where EMP.DEPTNO = DEPT.DEPTNO);

    EMPNO ENAME                JOB              MGR HIREDATE         SAL     DEPTNO
---------- ---------- ---------- ---------- --------- ---------- ----------
      7269 ADAM                 CLERK           7901 17-DEC-82         900
      7699 JANE                 PROGRAMMER           20-MAR-81        1600
```

CREATE A NEW TABLE CALLED EMP2 WITH THE SAME STRUCTURE AS EMP.

```
CREATE TABLE EMP2(
        EMPNO       number(4) NOT NULL,
        ENAME       varchar(30) NOT NULL,
        JOB         char(10),
        MGR         number(4),
        HIREDATE    date,
        SAL         number(7,2),
        DEPTNO      number(2)
                    );

SQL> CREATE TABLE EMP2(
  2   EMPNO  number(4) NOT NULL,
  3   ENAME  varchar(30) NOT NULL,
  4   JOB   char(10),
  5   MGR  number(4),
  6   HIREDATE date,
  7   SAL  number(7,2),
  8   DEPTNO number(2)
  9    );

Table created.

INSERT INTO EMP2 VALUES (7269, 'ADAM', 'CLERK', 7901, '17-DEC-82', 900, NULL);
INSERT INTO EMP2 VALUES (7699, 'JANE', 'PROGRAMMER', NULL, '20-MAR-81', 1600, NULL);
INSERT INTO EMP2 VALUES (7902, 'FORD', 'ANALYST', 7576, '03-DEC-81', 3450, 10);
INSERT INTO EMP2 VALUES (7698, 'BLAKE', 'MANAGER', NULL, '01-MAY-81', 4427.5, 30);
INSERT INTO EMP2 VALUES (7233, 'BOB', 'A_MANAGER', 7902, '17-DEC-83', 3300, 20);
```

INSERT INTO EMP2 VALUES (7244, 'MARY', 'J_DESIGNER', NULL, '22-MAR-81', 1400, 40);

SQL> INSERT INTO EMP2 VALUES (7269, 'ADAM', 'CLERK', 7901, '17-DEC-82', 900, NULL);

1 row created.

SQL> INSERT INTO EMP2 VALUES (7699, 'JANE', 'PROGRAMMER', NULL, '20-MAR-81', 1600, NULL);

1 row created.

SQL> INSERT INTO EMP2 VALUES (7902, 'FORD', 'ANALYST', 7576, '03-DEC-81', 3450, 10);

1 row created.

SQL> INSERT INTO EMP2 VALUES (7698, 'BLAKE', 'MANAGER', NULL, '01-MAY-81', 4427.5, 30);

1 row created.

SQL> INSERT INTO EMP2 VALUES (7233, 'BOB', 'A_MANAGER', 7902, '17-DEC-83', 3300, 20);

1 row created.

SQL> INSERT INTO EMP2 VALUES (7244, 'MARY', 'J_DESIGNER', NULL, '22-MAR-81', 1400, 40);

1 row created.

All employee numbers and names from both tables:

```
select EMPNO, ENAME from EMP
union
select EMPNO, ENAME from EMP2;
```

```
SQL> select EMPNO, ENAME from EMP
  2  union
  3  select EMPNO, ENAME from EMP2;

    EMPNO ENAME
---------- ----------
      7233 BOB
      7244 MARY
      7269 ADAM
      7369 SMITH
      7499 ALLEN
      7521 WARD
      7698 BLAKE
      7699 JANE
      7902 FORD

9 rows selected.
```

Employees who are listed in both EMP and EMP2:

```
SQL> select * from EMP
```

```
  2  intersect
  3  select * from EMP2;

    EMPNO ENAME                JOB              MGR HIREDATE         SAL     DEPTNO
---------- ---------- ---------- ---------- --------- ---------- ----------
      7269 ADAM                 CLERK           7901 17-DEC-82         900
      7698 BLAKE                MANAGER              01-MAY-81     4427.5         30
      7699 JANE                 PROGRAMMER           20-MAR-81        1600
      7902 FORD                 ANALYST         7576 03-DEC-81       3450         10
```

Employees who are only listed in EMP:

```
select * from EMP
minus
select * from EMP2;
```

```
SQL> select * from EMP
  2  minus
  3  select * from EMP2;

    EMPNO ENAME                JOB              MGR HIREDATE         SAL     DEPTNO
---------- ---------- ---------- ---------- --------- ---------- ----------
      7369 SMITH                CLERK           7902 17-DEC-80       800         20
      7499 ALLEN                SALESMAN         7698 20-FEB-81     4427.5         30
      7521 WARD                 SALESMAN         7698 22-FEB-81     4427.5         40
```

For each department, we want to retrieve the minimum and maximum salary.

```
select DEPTNO, min(SAL), max(SAL)
from EMP
group by DEPTNO;
```

```
SQL> select DEPTNO, min(SAL), max(SAL)
  2  from EMP
  3  group by DEPTNO;

    DEPTNO   MIN(SAL)   MAX(SAL)
---------- ---------- ----------
        10       3450       3450
        20        800        800
        30     4427.5     4427.5
        40     4427.5     4427.5
                900       1600
```

Retrieve the minimum and maximum salary of clerks for each department having more than TWO clerks.

```
select DEPTNO, min(SAL), max(SAL)
from EMP
where JOB = 'CLERK'
group by DEPTNO
having count(*) > 2;
```

```
select DEPTNO, min(SAL), max(SAL)
from EMP
where JOB = 'CLERK'
group by DEPTNO
having count(*) < 3;
```

VIEWS

The following view contains the name, job title and the annual salary of employees working in the department 20:

```
create view DEPT20 as
select ENAME, JOB, SAL*12 AS ANNUAL_SALARY from EMP
where DEPTNO = 20;
```

```
SQL> create view DEPT20 as
  2  select ENAME, JOB, SAL*12 AS ANNUAL_SALARY from EMP
  3  where DEPTNO = 20;

View created.

SQL>
SQL> SELECT * FROM DEPT20;

ENAME                          JOB       ANNUAL_SALARY
------------------------------ ---------- -------------
SMITH                          CLERK             9600
```

++

TRY THESE COMMANDS AND SEE THE RESULTS FOR YOURSELF

```
SELECT * FROM TAB;

SELECT * FROM COL;
```