Fair Use Notice:

DATABASE SYSTEMS (SW215)

DATA QUERY LANGUAGES

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CATEGORIES OF SQL STATEMENTS

1. **Data Definition Languages (DDL).**
2. **Data Query Languages (DQL).**
3. **Data Manipulation Languages (DML).**
4. **Data Control Languages (DCL).**
5. **Transaction Control Languages (TCL).**

DATA QUERY LANGUAGES (DQL)

- DQL statements are used for performing queries on the data within schema objects.
- Following is the command included in this category:

1. SELECT

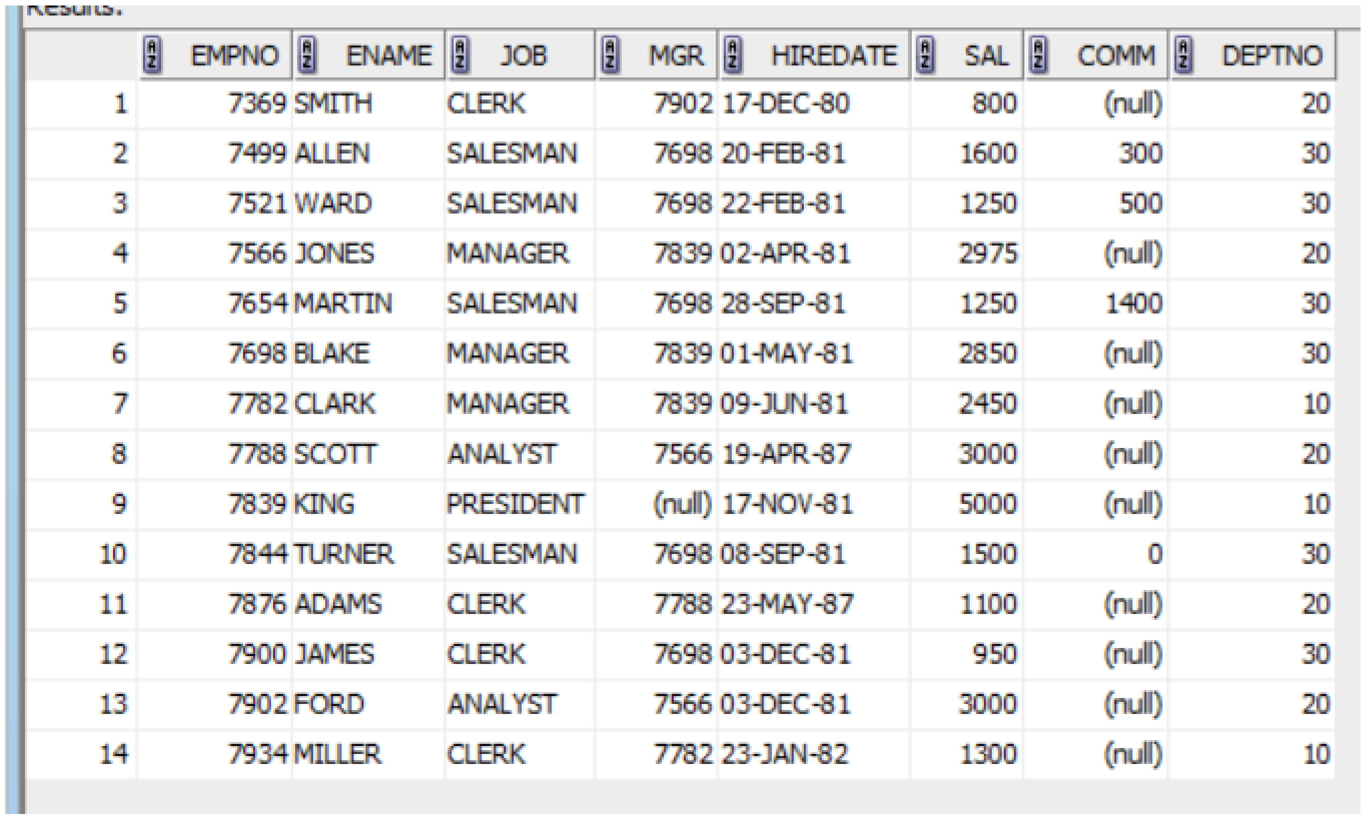
EMP TABLE

Empno (PK)	Ename	job	Mgr	hiredate	sal	comm	Deptno (FK)
7369	SMITH	CLERK	7902	17-DEC-80	800		20
7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30
7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30
7566	JONES	MANAGER	7839	02-APR-81	2975		20
7654	BLAKE	MANAGER	7839	01-MAY-81	2850		30

Deptno (PK)	dname	loc
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO

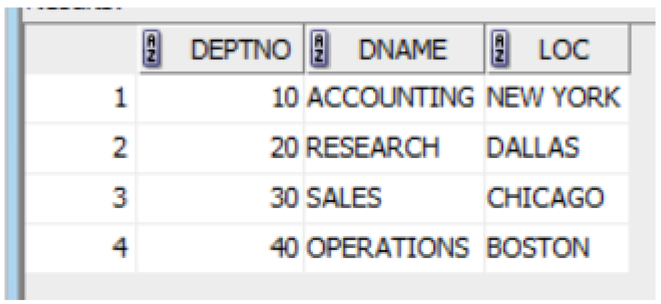
DEPT TABLE

EMP TABE



	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
1	7369	SMITH	CLERK	7902	17-DEC-80	800	(null)	20
2	7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30
3	7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30
4	7566	JONES	MANAGER	7839	02-APR-81	2975	(null)	20
5	7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	30
6	7698	BLAKE	MANAGER	7839	01-MAY-81	2850	(null)	30
7	7782	CLARK	MANAGER	7839	09-JUN-81	2450	(null)	10
8	7788	SCOTT	ANALYST	7566	19-APR-87	3000	(null)	20
9	7839	KING	PRESIDENT	(null)	17-NOV-81	5000	(null)	10
10	7844	TURNER	SALESMAN	7698	08-SEP-81	1500	0	30
11	7876	ADAMS	CLERK	7788	23-MAY-87	1100	(null)	20
12	7900	JAMES	CLERK	7698	03-DEC-81	950	(null)	30
13	7902	FORD	ANALYST	7566	03-DEC-81	3000	(null)	20
14	7934	MILLER	CLERK	7782	23-JAN-82	1300	(null)	10

DEPT TABE



	DEPTNO	DNAME	LOC
1	10	ACCOUNTING	NEW YORK
2	20	RESEARCH	DALLAS
3	30	SALES	CHICAGO
4	40	OPERATIONS	BOSTON

SELECT STATEMENT

- SELECT statement retrieves information from the database. Using a SELECT statement, you can do the following:

1. Projection: You can use the projection capability in SQL to choose the columns in a table that you want to be returned by your query. You can choose as few or as many columns in the table as you require.

2. Selection: You can use the selection capability in SQL to choose the rows in a table that you want to be returned by a query.

  - You can use various criteria to restrict the rows that you see.

3. Joining: You can use the join capability in SQL to bring together data that is stored in different tables by creating a link between them.

SYNTAX:

```
SELECT * I [ DISTINCT I UNIQUE] (column_ name [ AS alias ] ,arithmetic
expr)
FROM              table _ name  [,……………]
[ WHERE           condition     ]
[ GROUP BY        column_list   ]
[ HAVING          condition     ]
[ ORDER BY        column_list   ] ;
```

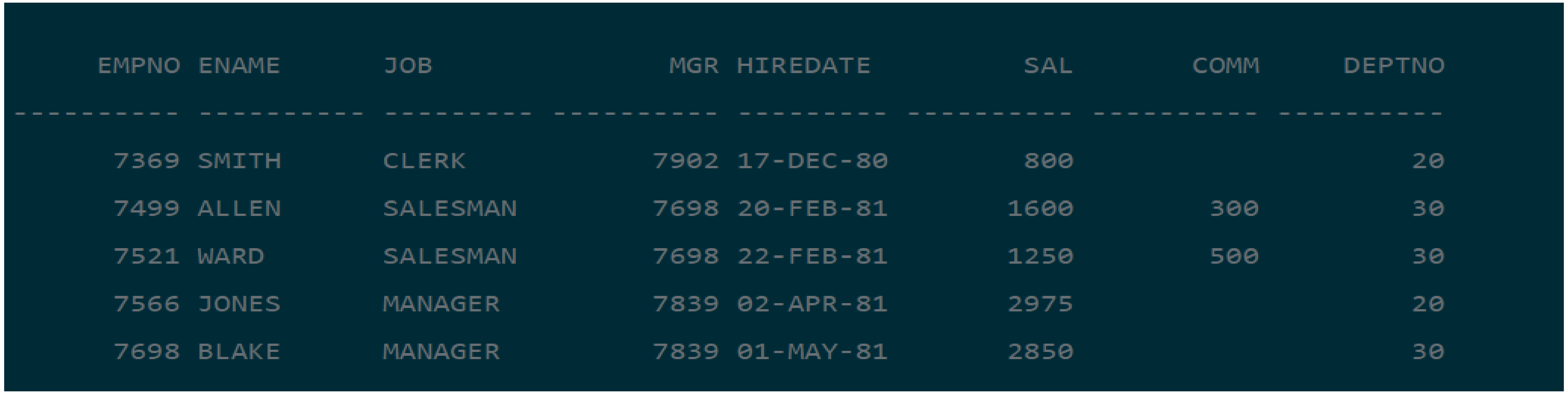
RETRIVING THE COMPLETE TABLE

SELECT * | [DISTINCT | UNIQUE] (column_ name [AS alias] ,arithmetic expr)
FROM table _ name [,…………….]

EXAMPLE A:

```
SELECT  *
    FROM emp ;
```

OUTPUT:



```
     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7369 SMITH      CLERK           7902 17-DEC-80        800                    20
      7499 ALLEN      SALESMAN        7698 20-FEB-81       1600        300         30
      7521 WARD       SALESMAN        7698 22-FEB-81       1250        500         30
      7566 JONES      MANAGER         7839 02-APR-81       2975                    20
      7698 BLAKE      MANAGER         7839 01-MAY-81       2850                    30
```

8 COLUMNS , 14 ROWS

RETRIVING SPECIFIC COLUMNS

SELECT * I [DISTINCT I UNIQUE] (column_ name [AS alias] ,arithmetic expr)
FROM table _ name [,……………]

EXAMPLE B:

SELECT empno, ename, sal, deptno

FROM emp ;

OUTPUT:

4 COLUMNS , 14 ROWS

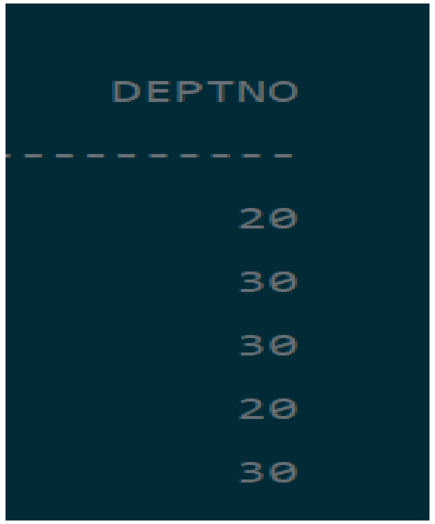
EXAMPLE C:

SELECT deptno

FROM emp ;

OUTPUT:

1 COLUMN, 14 ROWS



```
    DEPTNO
----------
        20
        30
        30
        20
        30
```

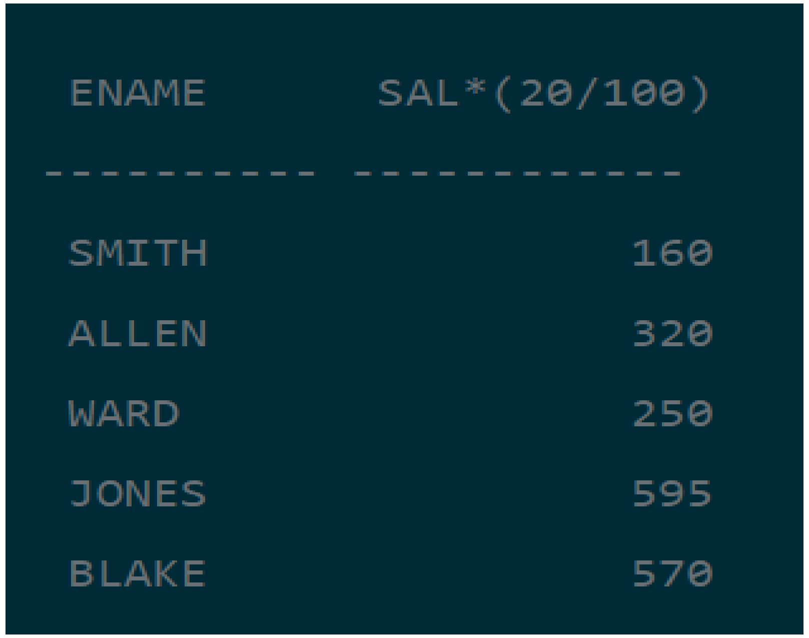
USING ARITHMETIC EXPRESSIONS

SELECT * I [DISTINCT I UNIQUE] (column_ name [AS alias] ,arithmetic expr)
FROM table _ name [,...............]

EXAMPLE D:

```
SELECT ename , sal * (20/100)
FROM emp ;
```

OUTPUT:



```
 ENAME       SAL*(20/100)
---------- ------------
 SMITH              160
 ALLEN              320
 WARD               250
 JONES              595
 BLAKE              570
```

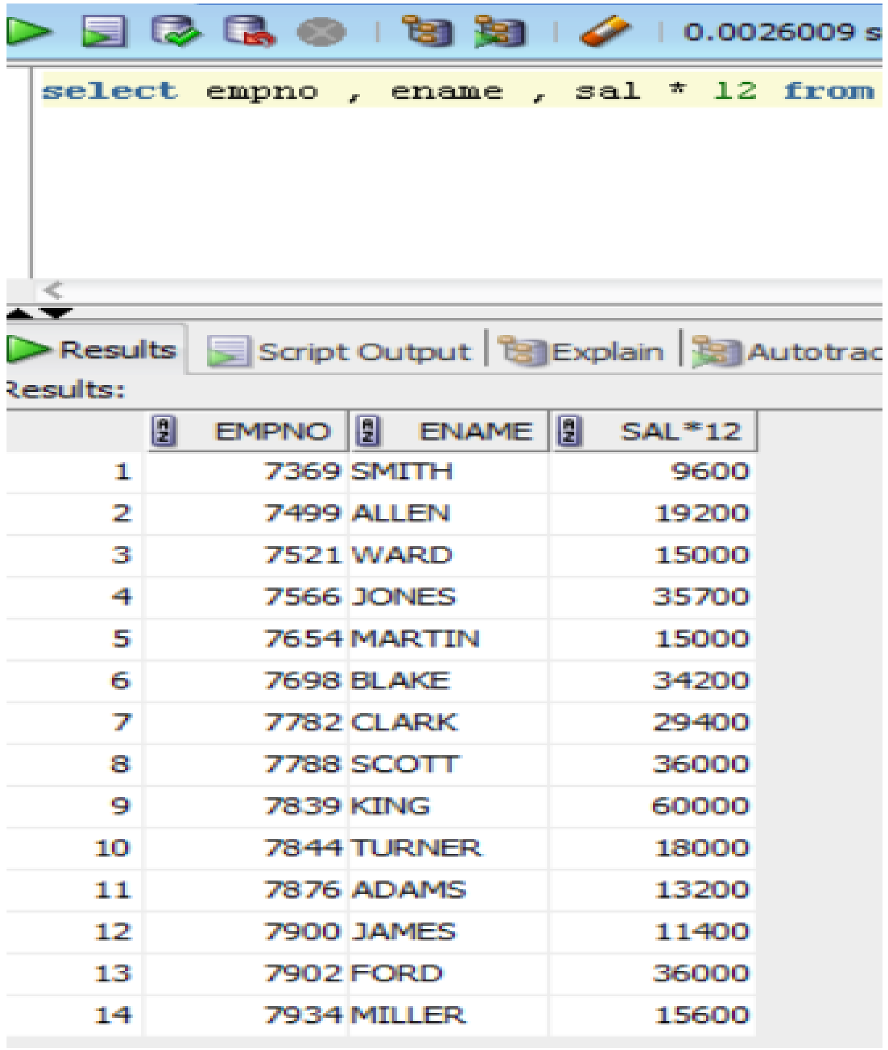
TASK A

- Display the Annual Salary of all the employees.

QUERY:

```
SELECT  empno , ename , sal*12
FROM    emp ;
```

OUTPUT:



```
select empno , ename , sal * 12 from
```

Results:

	EMPNO	ENAME	SAL*12
1	7369	SMITH	9600
2	7499	ALLEN	19200
3	7521	WARD	15000
4	7566	JONES	35700
5	7654	MARTIN	15000
6	7698	BLAKE	34200
7	7782	CLARK	29400
8	7788	SCOTT	36000
9	7839	KING	60000
10	7844	TURNER	18000
11	7876	ADAMS	13200
12	7900	JAMES	11400
13	7902	FORD	36000
14	7934	MILLER	15600

USING ALIAS

SELECT * I [DISTINCT I UNIQUE] (column_ name [AS alias] ,arithmetic expr)
FROM table _ name [,……………]

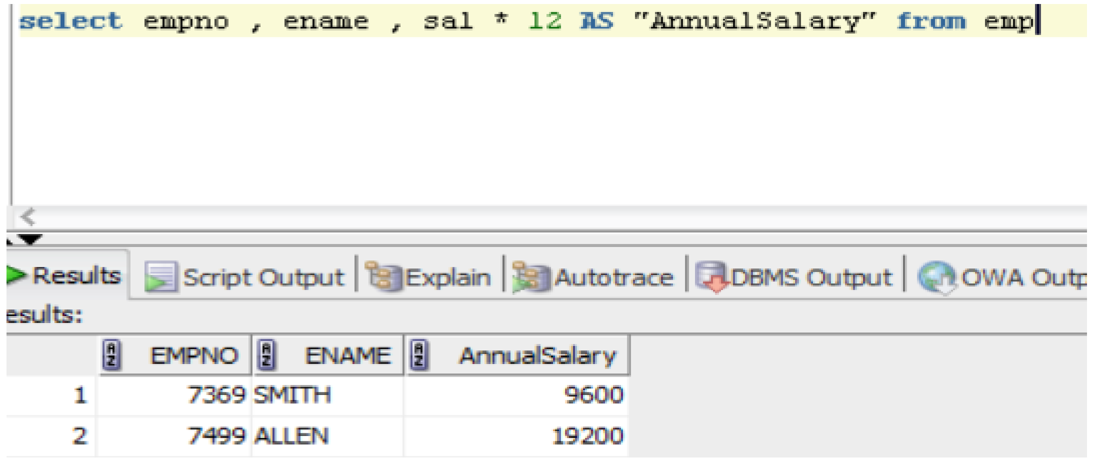
EXAMPLE E:

SELECT empno , ename , sal*12 AS AnnualSalary
FROM emp ;

EXAMPLE F:

SELECT empno , ename , sal*12 AS “AnnualSalary”
FROM emp ;

OUTPUT:



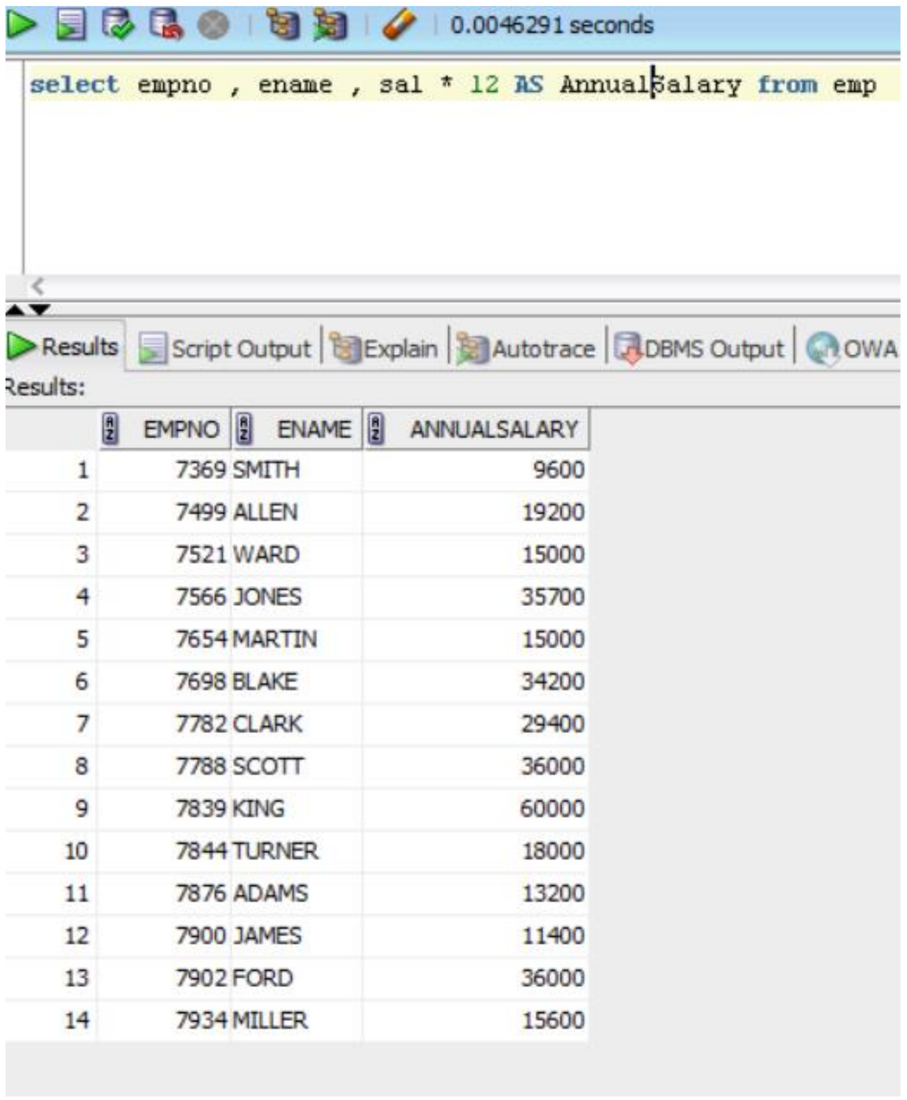
```
select empno , ename , sal * 12 AS "AnnualSalary" from emp
```

Results | Script Output | Explain | Autotrace | DBMS Output | OWA Outp

esults:

	EMPNO	ENAME	AnnualSalary
1	7369	SMITH	9600
2	7499	ALLEN	19200

OUTPUT EXAMPLE E:



0.0046291 seconds

```
select empno , ename , sal * 12 AS AnnualSalary from emp
```

Results | Script Output | Explain | Autotrace | DBMS Output | OWA

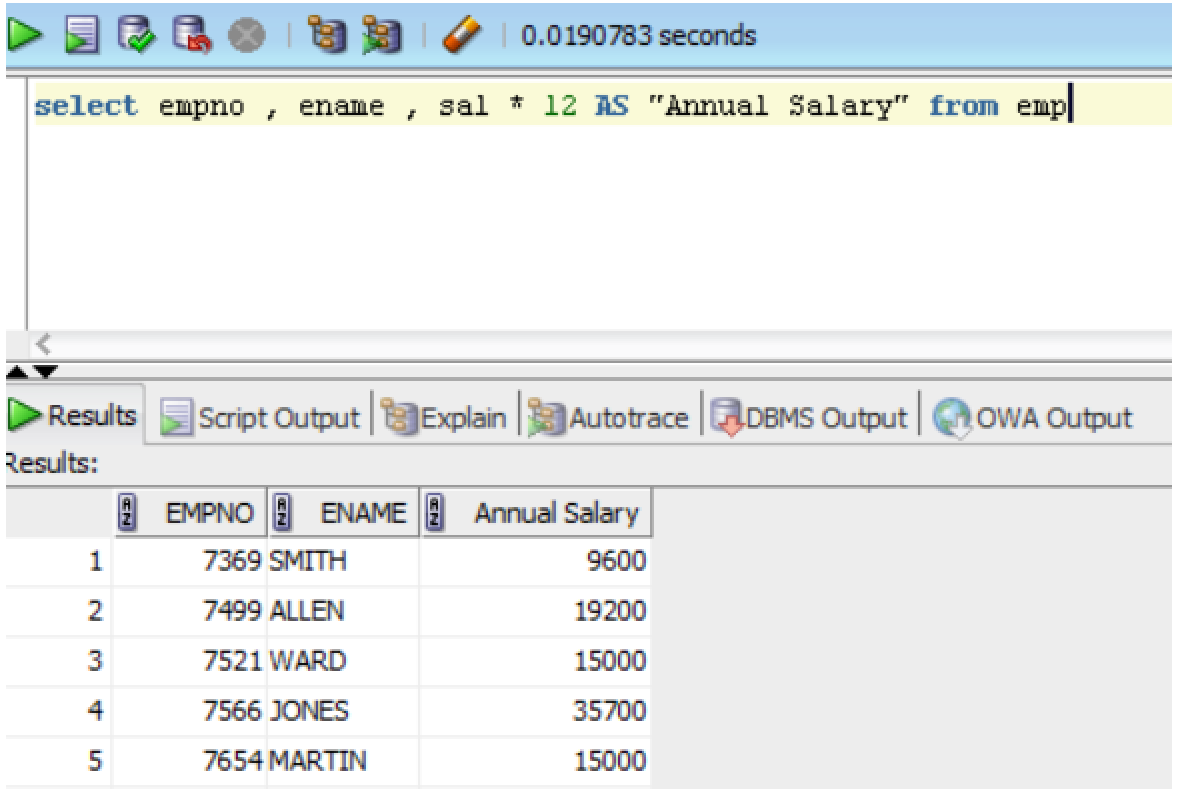
Results:

	EMPNO	ENAME	ANNUALSALARY
1	7369	SMITH	9600
2	7499	ALLEN	19200
3	7521	WARD	15000
4	7566	JONES	35700
5	7654	MARTIN	15000
6	7698	BLAKE	34200
7	7782	CLARK	29400
8	7788	SCOTT	36000
9	7839	KING	60000
10	7844	TURNER	18000
11	7876	ADAMS	13200
12	7900	JAMES	11400
13	7902	FORD	36000
14	7934	MILLER	15600

EXAMPLE G:

```
SELECT  empno , ename , sal*12 AS "Annual Salary"
FROM    emp ;
```

OUTPUT:

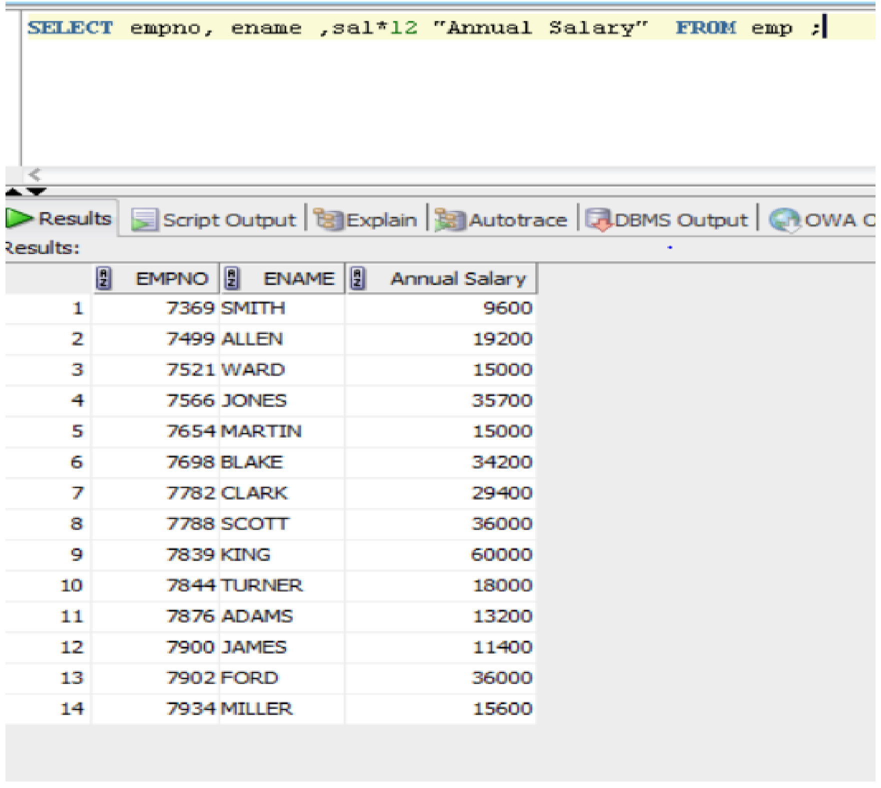


```
select empno , ename , sal * 12 AS "Annual Salary" from emp
```

Results:

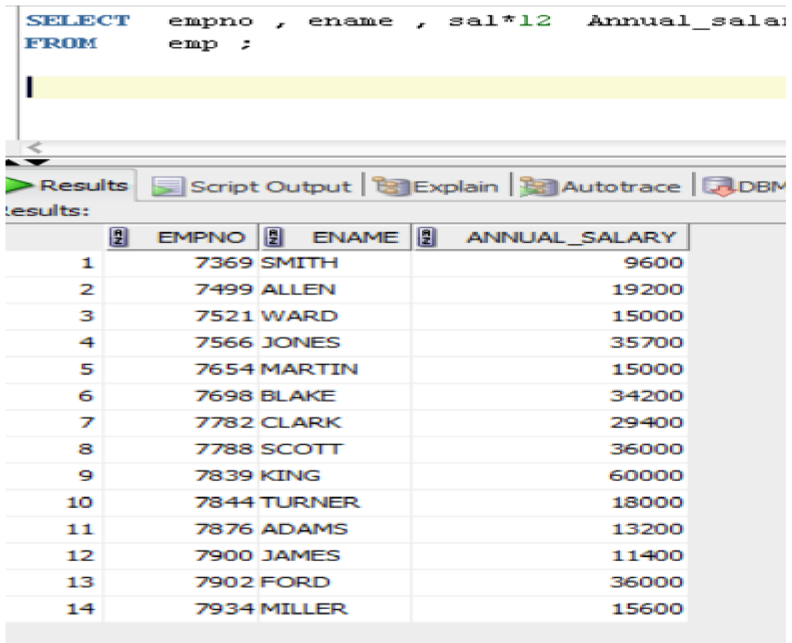
	EMPNO	ENAME	Annual Salary
1	7369	SMITH	9600
2	7499	ALLEN	19200
3	7521	WARD	15000
4	7566	JONES	35700
5	7654	MARTIN	15000

1. SELECT empno , ename , sal*12 “Annual Salary”
   FROM   emp ; ✓
2. SELECT empno , ename , sal*12 AS Annual Salary
   FROM   emp ; ✗
3. SELECT empno , ename , sal*12 Annual
   FROM   emp ; ✓
4. SELECT empno , ename , sal*12 Annual_salary
   FROM   emp ; ✓
5. SELECT empno , ename , sal*12 'Annual_salary’
   FROM   emp ; ✗



```
SELECT empno, ename ,sal*12 "Annual Salary"  FROM emp ;
```

	EMPNO	ENAME	Annual Salary
1	7369	SMITH	9600
2	7499	ALLEN	19200
3	7521	WARD	15000
4	7566	JONES	35700
5	7654	MARTIN	15000
6	7698	BLAKE	34200
7	7782	CLARK	29400
8	7788	SCOTT	36000
9	7839	KING	60000
10	7844	TURNER	18000
11	7876	ADAMS	13200
12	7900	JAMES	11400
13	7902	FORD	36000
14	7934	MILLER	15600



```
SELECT     empno , ename , sal*12   Annual_sala
FROM       emp ;
```

	EMPNO	ENAME	ANNUAL_SALARY
1	7369	SMITH	9600
2	7499	ALLEN	19200
3	7521	WARD	15000
4	7566	JONES	35700
5	7654	MARTIN	15000
6	7698	BLAKE	34200
7	7782	CLARK	29400
8	7788	SCOTT	36000
9	7839	KING	60000
10	7844	TURNER	18000
11	7876	ADAMS	13200
12	7900	JAMES	11400
13	7902	FORD	36000
14	7934	MILLER	15600

USING DISTINCT KEYWORD

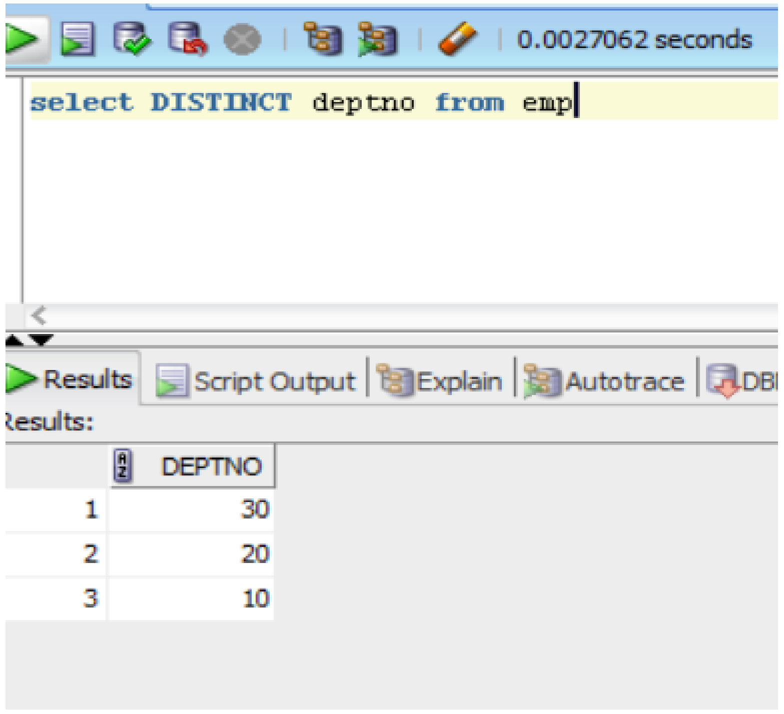
SELECT * I [DISTINCT I UNIQUE] (column_ name [AS alias] ,arithmetic expr)
FROM table _ name [,……………]

EXAMPLE H:

SELECT DISTINCT deptno

FROM emp ;

OUTPUT:



```
select DISTINCT deptno from emp
```

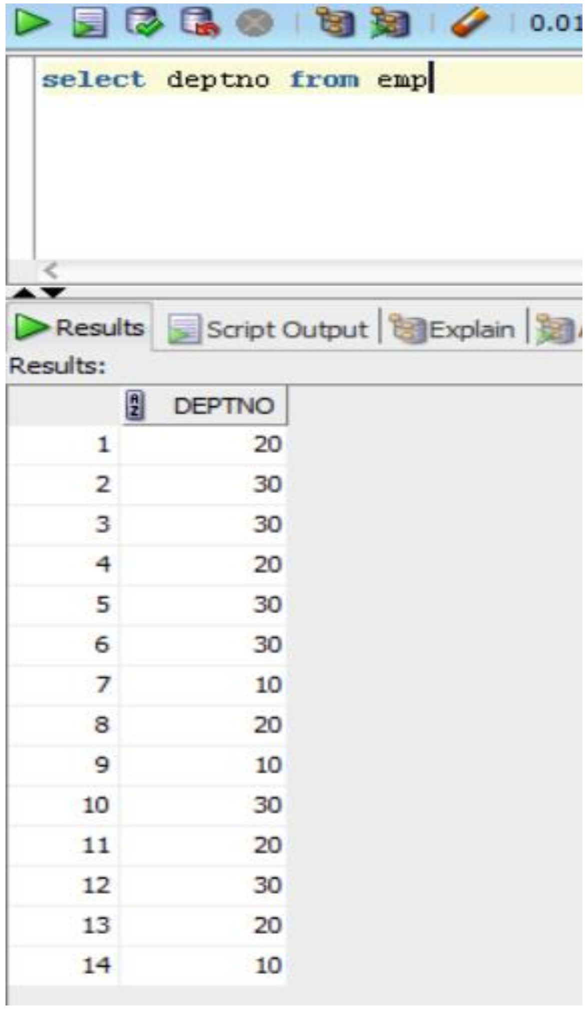
```
Results:
     DEPTNO
1        30
2        20
3        10
```

EXAMPLE C:

SELECT deptno

FROM emp ;

OUTPUT:



```
select deptno from emp
```

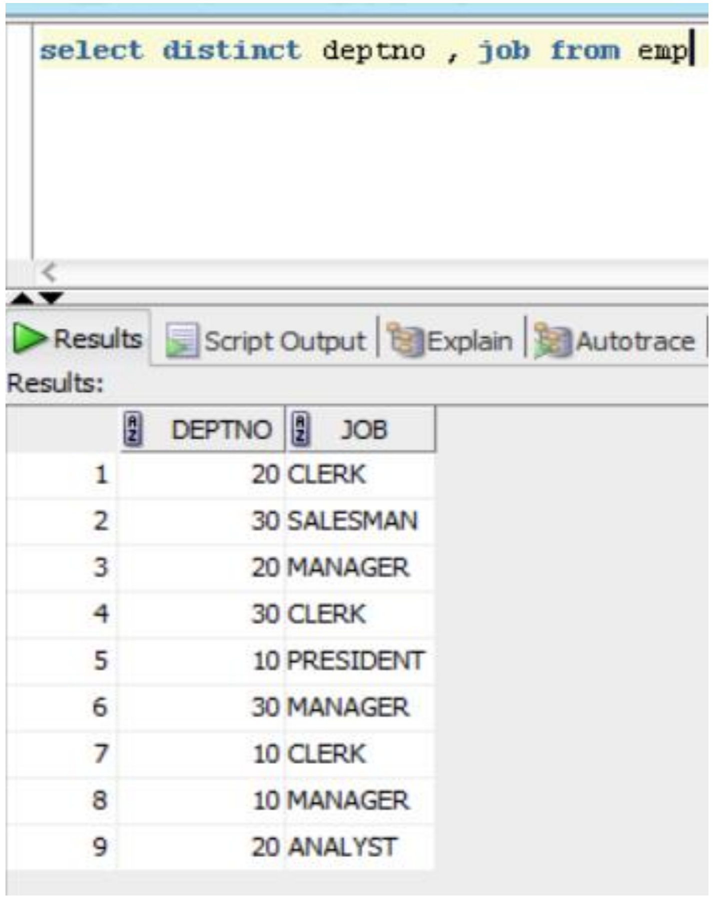
```
Results:
      DEPTNO
 1        20
 2        30
 3        30
 4        20
 5        30
 6        30
 7        10
 8        20
 9        10
10        30
11        20
12        30
13        20
14        10
```

EXAMPLE H:

SELECT DISTINCT deptno, job

FROM emp ;

OUTPUT:



```
select distinct deptno , job from emp
```

Results:

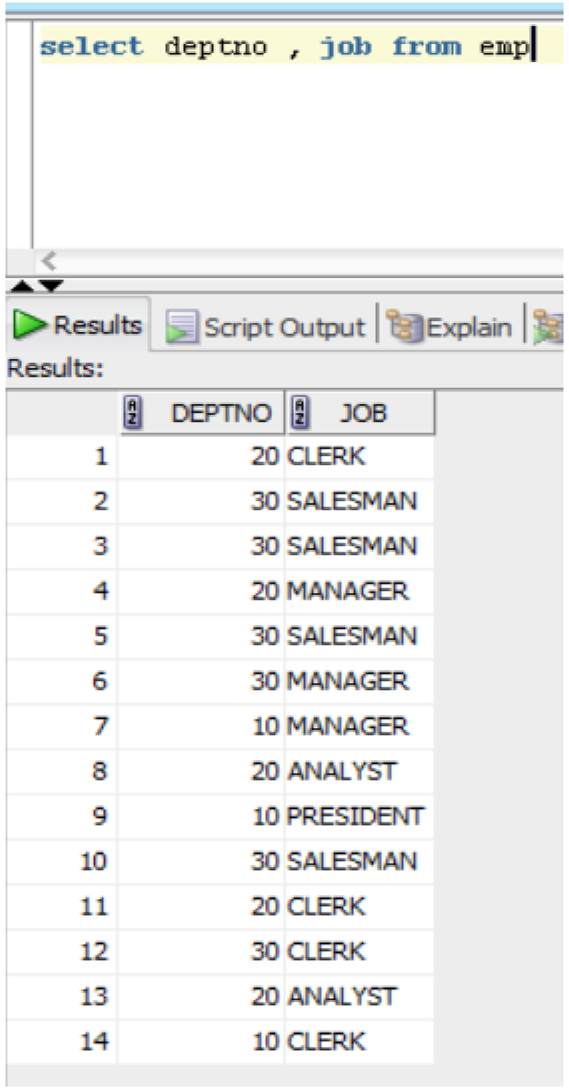
	DEPTNO	JOB
1	20	CLERK
2	30	SALESMAN
3	20	MANAGER
4	30	CLERK
5	10	PRESIDENT
6	30	MANAGER
7	10	CLERK
8	10	MANAGER
9	20	ANALYST

EXAMPLE I:

SELECT deptno, job

FROM emp ;

OUTPUT:



```
select deptno , job from emp
```

Results:

	DEPTNO	JOB
1	20	CLERK
2	30	SALESMAN
3	30	SALESMAN
4	20	MANAGER
5	30	SALESMAN
6	30	MANAGER
7	10	MANAGER
8	20	ANALYST
9	10	PRESIDENT
10	30	SALESMAN
11	20	CLERK
12	30	CLERK
13	20	ANALYST
14	10	CLERK

CONCATENATION

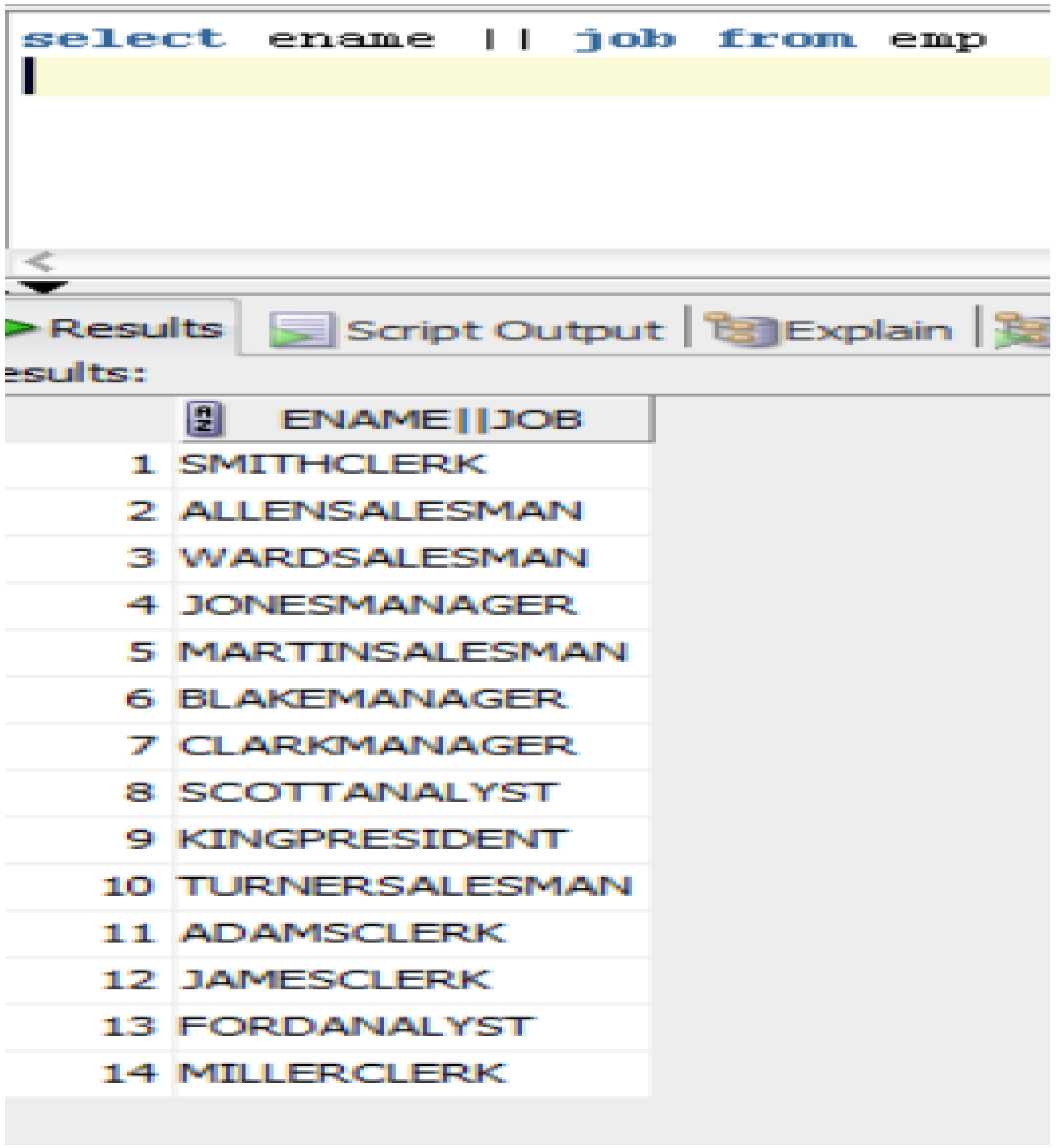
You can add your own statements in the output using **CONCAT** function or operators like **||** .

EXAMPLE J:

SELECT ename || job

FROM emp ;

OUTPUT:



```
select ename || job from emp
```

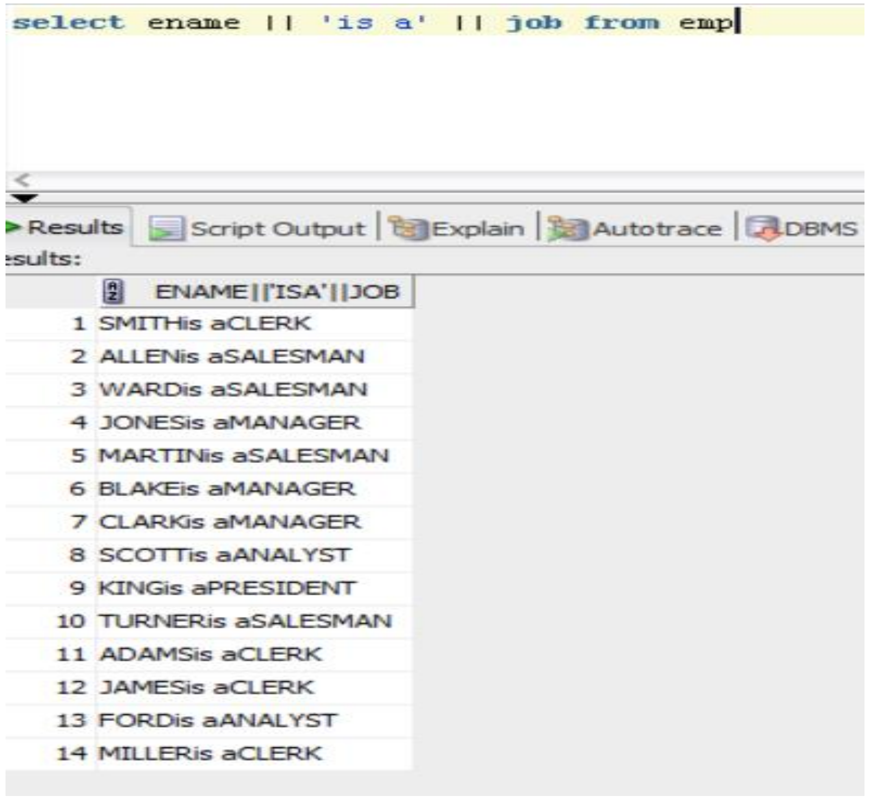
```
   ENAME||JOB
 1 SMITHCLERK
 2 ALLENSALESMAN
 3 WARDSALESMAN
 4 JONESMANAGER
 5 MARTINSALESMAN
 6 BLAKEMANAGER
 7 CLARKMANAGER
 8 SCOTTANALYST
 9 KINGPRESIDENT
10 TURNERSALESMAN
11 ADAMSCLERK
12 JAMESCLERK
13 FORDANALYST
14 MILLERCLERK
```

EXAMPLE K:

SELECT ename || 'is a' || job

FROM emp ;

OUTPUT:



```
select ename || 'is a' || job from emp
```

```
     ENAME||'ISA'||JOB
 1   SMITHis aCLERK
 2   ALLENis aSALESMAN
 3   WARDis aSALESMAN
 4   JONESis aMANAGER
 5   MARTINis aSALESMAN
 6   BLAKEis aMANAGER
 7   CLARKis aMANAGER
 8   SCOTTis aANALYST
 9   KINGis aPRESIDENT
10   TURNERis aSALESMAN
11   ADAMSis aCLERK
12   JAMESis aCLERK
13   FORDis aANALYST
14   MILLERis aCLERK
```

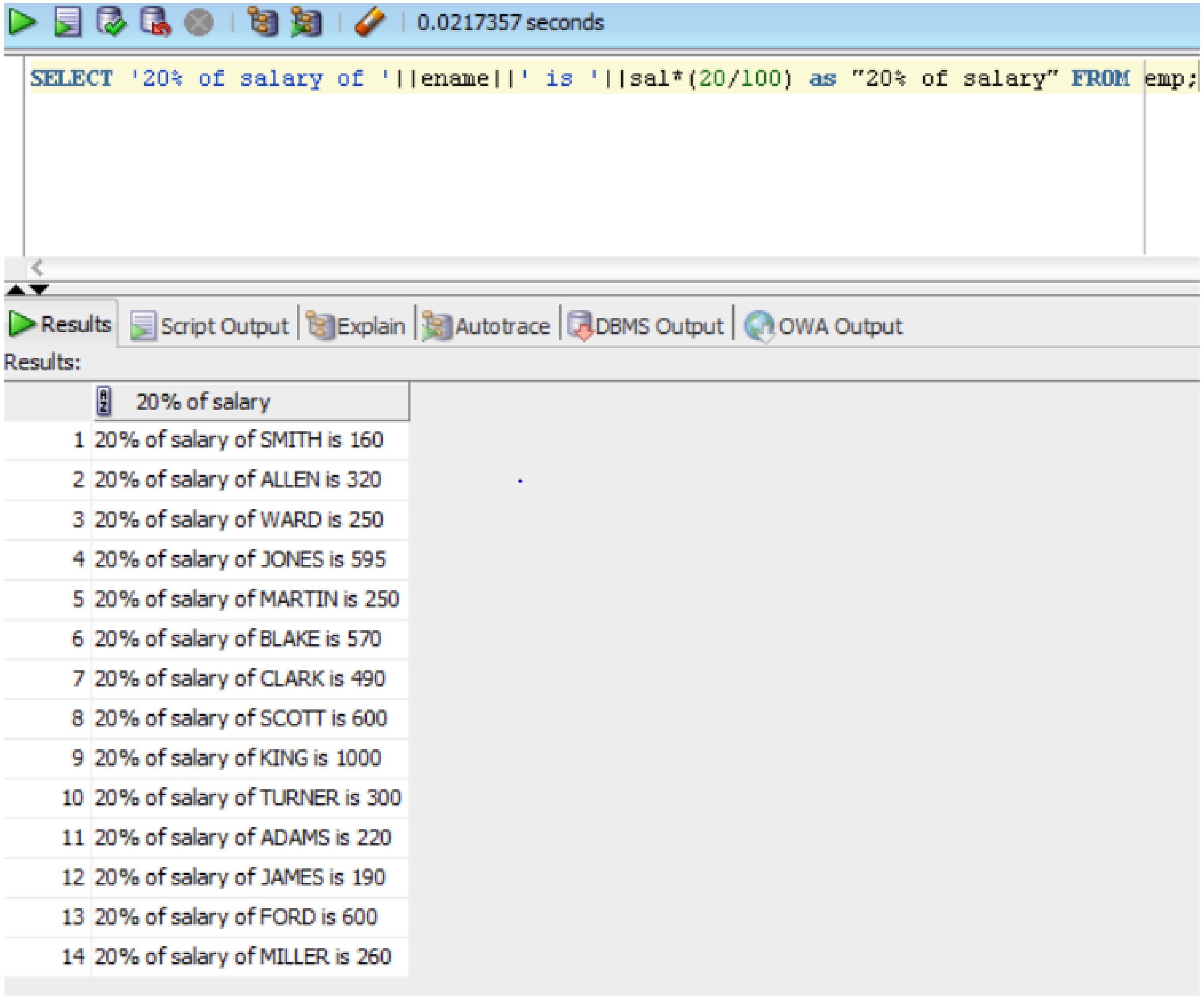
EXAMPLE L:

SELECT '20% of salary of '||ename||' is '||sal*(20/100) AS "20% of salary"

FROM emp;

OUTPUT:

OUTPUT EXAMPLE L



```
SELECT '20% of salary of '||ename||' is '||sal*(20/100) as "20% of salary" FROM emp;
```

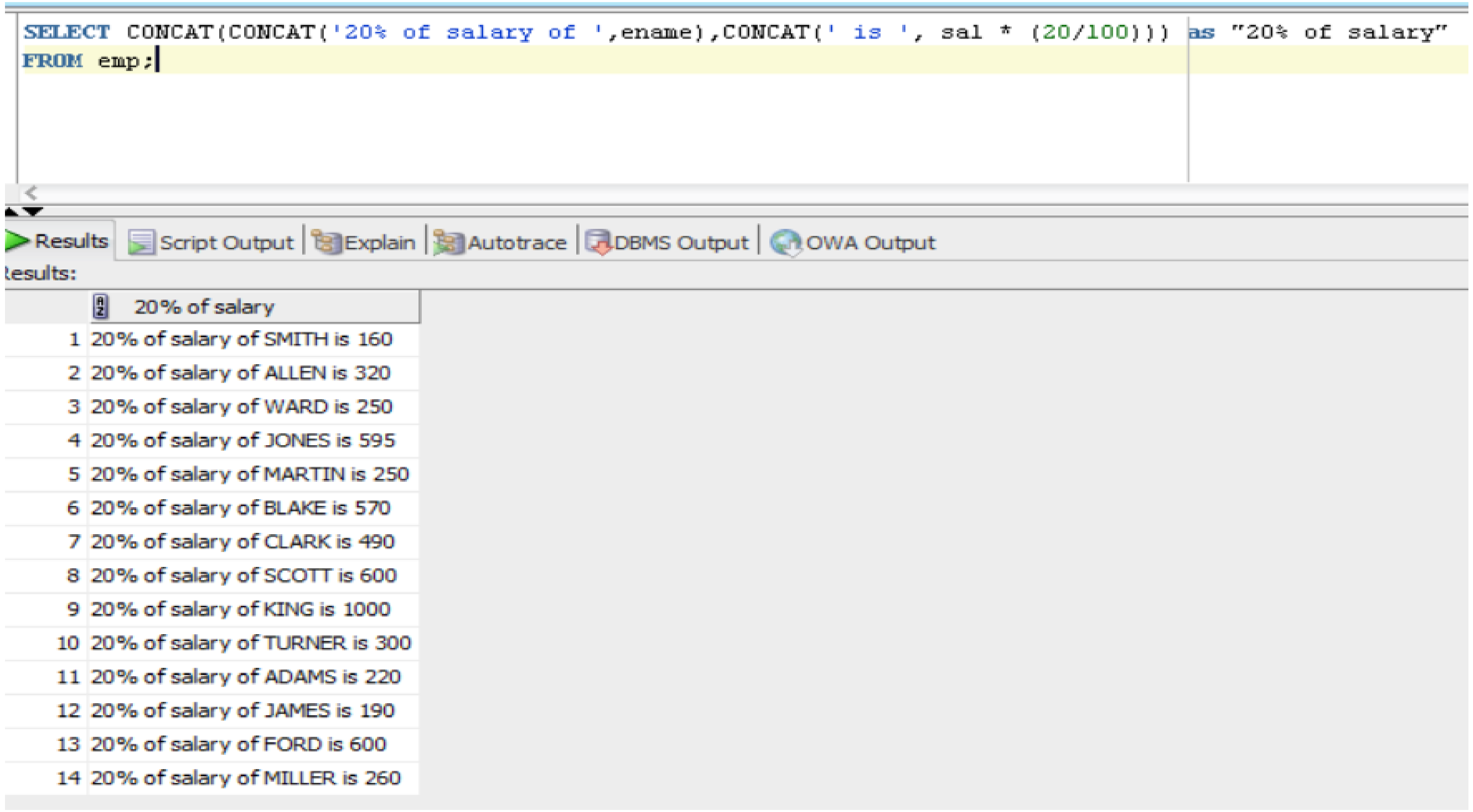
Results:

```
     20% of salary
 1   20% of salary of SMITH is 160
 2   20% of salary of ALLEN is 320
 3   20% of salary of WARD is 250
 4   20% of salary of JONES is 595
 5   20% of salary of MARTIN is 250
 6   20% of salary of BLAKE is 570
 7   20% of salary of CLARK is 490
 8   20% of salary of SCOTT is 600
 9   20% of salary of KING is 1000
10   20% of salary of TURNER is 300
11   20% of salary of ADAMS is 220
12   20% of salary of JAMES is 190
13   20% of salary of FORD is 600
14   20% of salary of MILLER is 260
```

EXAMPLE M:

```
SELECT CONCAT(CONCAT( '20% of salary of  ‘,ename), CONCAT(’ is ‘, sal*(20/100) ))
AS "20% of salary"

FROM emp;
```

OUTPUT:



```
SELECT CONCAT(CONCAT('20% of salary of ',ename),CONCAT(' is ', sal * (20/100))) as "20% of salary"
FROM emp;
```

```
   20% of salary
1  20% of salary of SMITH is 160
2  20% of salary of ALLEN is 320
3  20% of salary of WARD is 250
4  20% of salary of JONES is 595
5  20% of salary of MARTIN is 250
6  20% of salary of BLAKE is 570
7  20% of salary of CLARK is 490
8  20% of salary of SCOTT is 600
9  20% of salary of KING is 1000
10 20% of salary of TURNER is 300
11 20% of salary of ADAMS is 220
12 20% of salary of JAMES is 190
13 20% of salary of FORD is 600
14 20% of salary of MILLER is 260
```

TASK B

1. Find errors:

Select empno, ename sal x 12 Annual Salary

From emp;

2. Display employee's annual salary with one time bonus of $100.

3. Display annual compensation as monthly salary plus a monthly bonus of $100.

4. Display rows in following format:

Monthly Salary

King: 1 month Salary = 5000

5. Display kinds of Jobs available in employee table.

COMPARISION OPERATORS

1. Mathematical Operators

= > < < > or != or ^= <= >=

2. Logical Operators

NOT

AND

OR

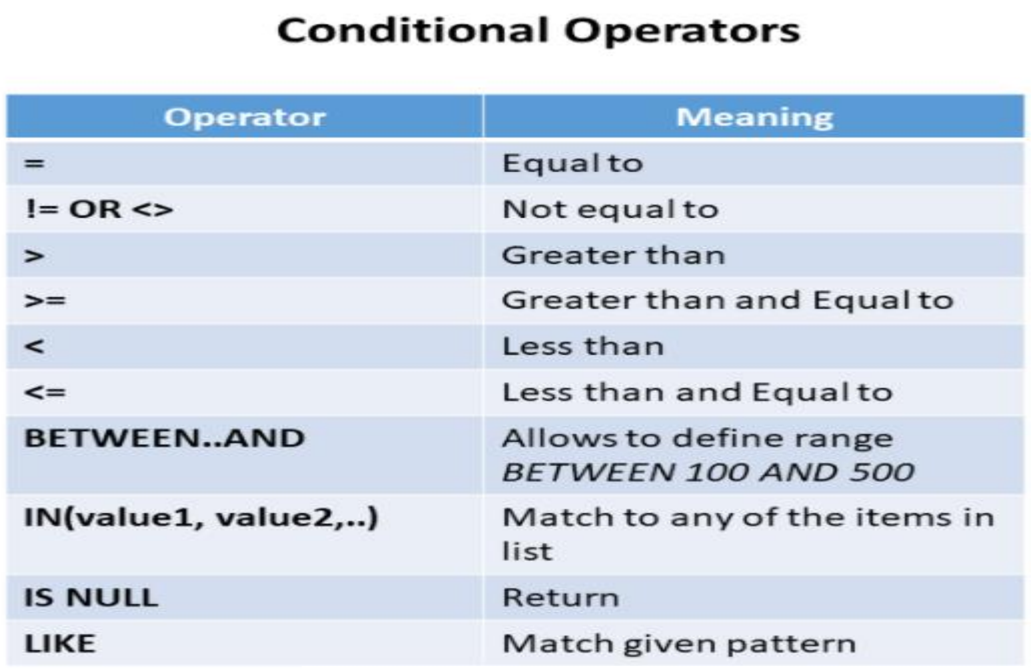
3. Conditional Operators

[NOT] BETWEEN lowerlimit AND upperlimit

[NOT] LIKE (Character Pattern)

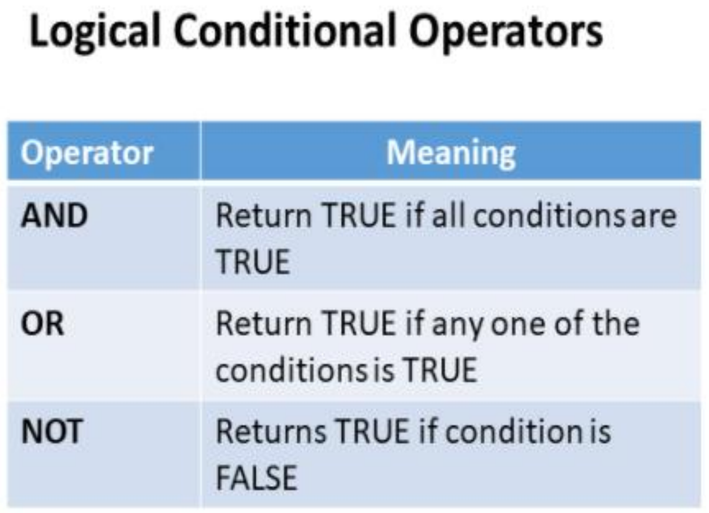
[NOT] IN (x,y,z……...)

IS [NOT] NULL



Conditional Operators

Operator	Meaning
=	Equal to
!= OR <>	Not equal to
>	Greater than
>=	Greater than and Equal to
<	Less than
<=	Less than and Equal to
BETWEEN..AND	Allows to define range *BETWEEN 100 AND 500*
IN(value1, value2,..)	Match to any of the items in list
IS NULL	Return
LIKE	Match given pattern



Logical Conditional Operators

Operator	Meaning
AND	Return TRUE if all conditions are TRUE
OR	Return TRUE if any one of the conditions is TRUE
NOT	Returns TRUE if condition is FALSE

OPERATOR PRECEDENCE

1. Mathematical Operators

2. Logical Operators
   - NOT
   - AND
   - OR

WHERE CLAUSE

SYNTAX:

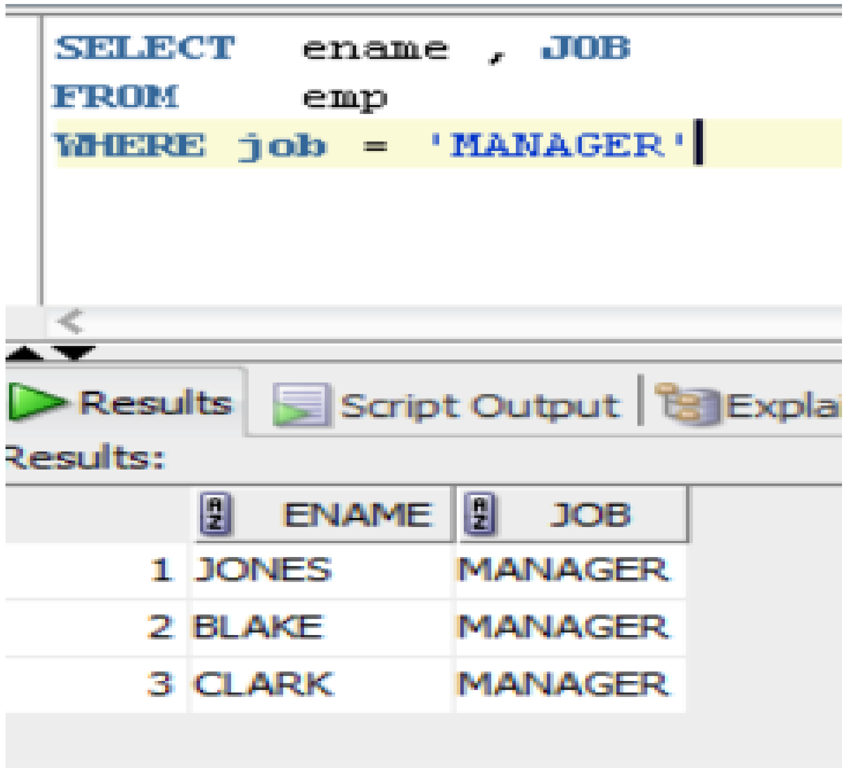
```
SELECT * I [ DISTINCT I UNIQUE] (column_ name [ AS alias ] ,arithmetic expr)
FROM                          table _ name  [,……………]
[ WHERE                       condition     ] ;
```

- **WHERE** clause is used to restrict rows in the output of the query.
- Only rows which meet the **WHERE** clause condition are displayed in the output.
- **WHERE** clause can be used to filter the records and fetching only the necessary records.
- The **WHERE** clause is not only used in the SELECT statement, but it is also used in the UPDATE, DELETE statement, etc.

EXAMPLE L:

```
SELECT ename, job
FROM    emp
WHERE job = ‘MANAGER’ ;
```

OUTPUT:



```
SELECT   ename , JOB
FROM     emp
WHERE job = 'MANAGER'
```

Results:

	ENAME	JOB
1	JONES	MANAGER
2	BLAKE	MANAGER
3	CLARK	MANAGER

```
1. SELECT  ename , job
        FROM    emp
        WHERE job = 'manager’;
```

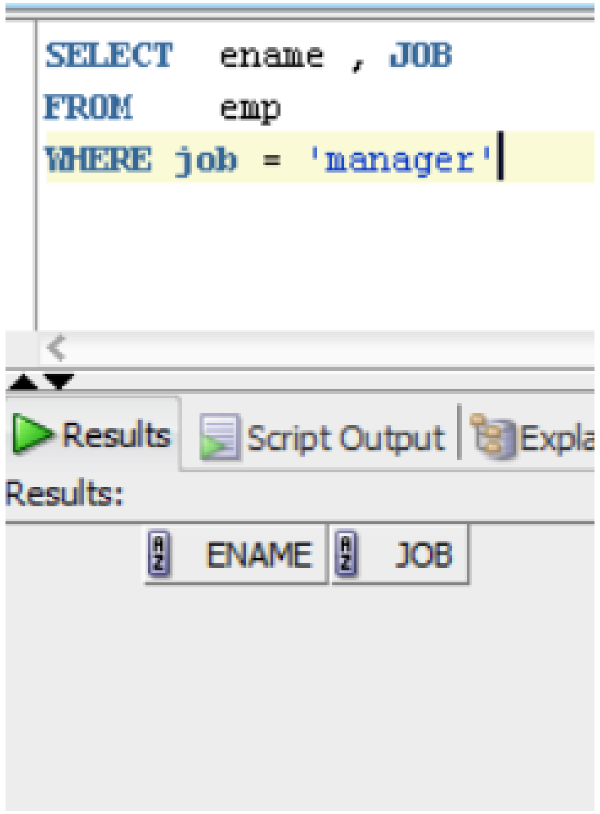
✓

```
2. SELECT  ename , JOB
        FROM    emp
        WHERE job = MANAGER;
```

✗

```
3. SELECT  ename , JOB
        FROM    emp
        WHERE job = "MANAGER"
```

✗



```
SELECT   ename , JOB
FROM     emp
WHERE job = 'manager'
```

Results:

ENAME	JOB

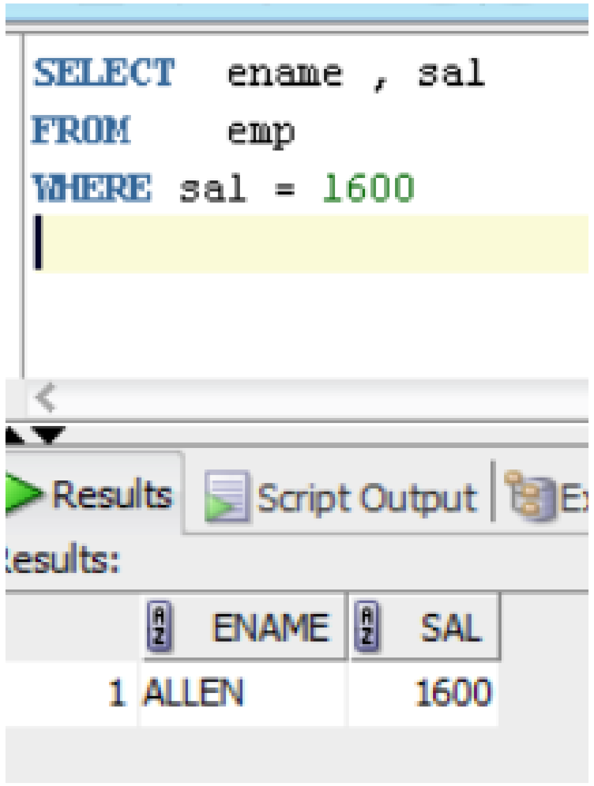
EXAMPLE M:

SELECT ename, sal

FROM emp

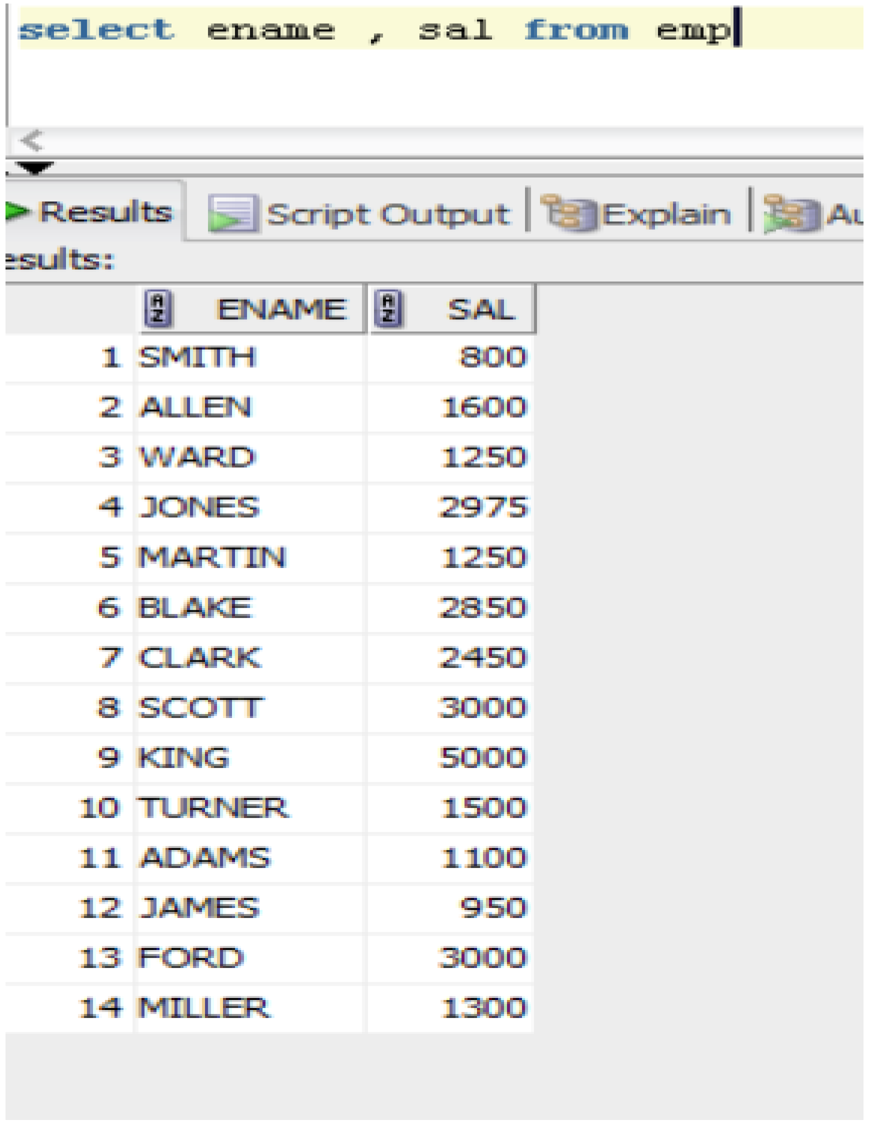
WHERE sal = 1600 ;

OUTPUT:



```
SELECT  ename , sal
FROM    emp
WHERE sal = 1600
```

	ENAME	SAL
1	ALLEN	1600



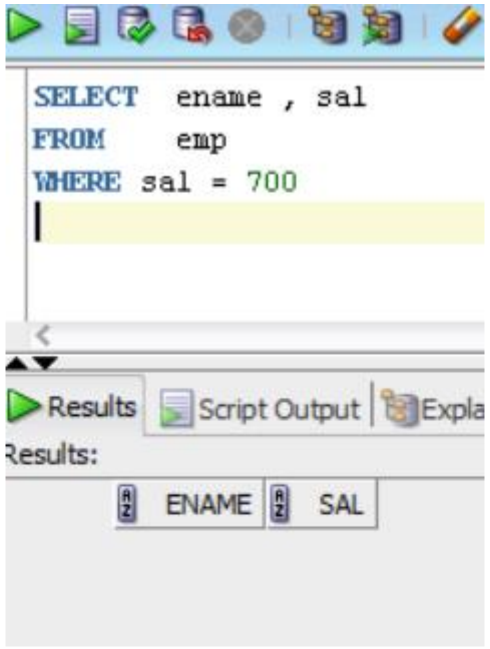
```
select ename , sal from emp
```

	ENAME	SAL
1	SMITH	800
2	ALLEN	1600
3	WARD	1250
4	JONES	2975
5	MARTIN	1250
6	BLAKE	2850
7	CLARK	2450
8	SCOTT	3000
9	KING	5000
10	TURNER	1500
11	ADAMS	1100
12	JAMES	950
13	FORD	3000
14	MILLER	1300

EXAMPLE N:

```
SELECT ename, sal
FROM    emp
WHERE sal = 700 ;
```

OUTPUT N:



```
SELECT   ename , sal
FROM     emp
WHERE sal = 700
```

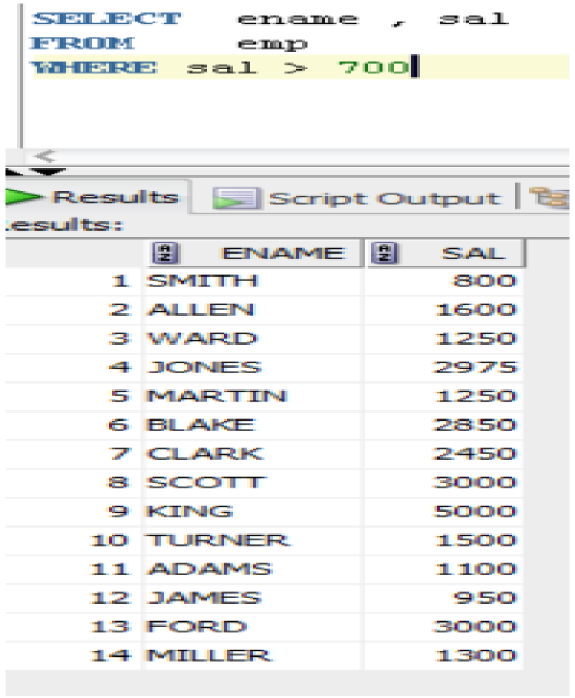
Results:

```
ENAME  SAL
```

EXAMPLE O:

```
SELECT ename, sal
FROM    emp
WHERE sal > 700 ;
```

OUTPUT O:

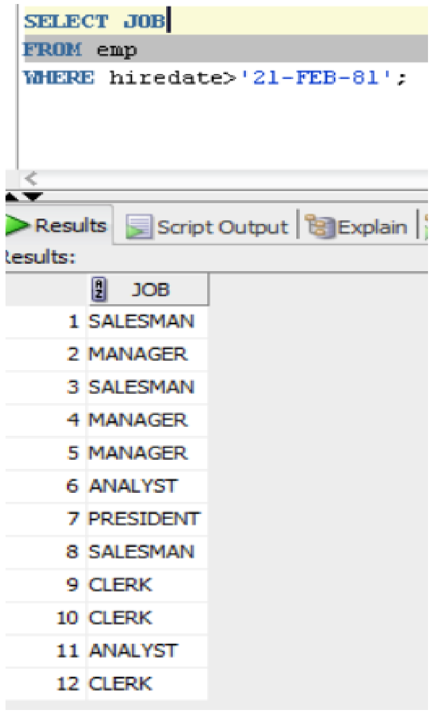


```
SELECT    ename , sal
FROM      emp
WHERE  sal > 700
```

esults:

```
     ENAME     SAL
 1   SMITH     800
 2   ALLEN    1600
 3   WARD     1250
 4   JONES    2975
 5   MARTIN   1250
 6   BLAKE    2850
 7   CLARK    2450
 8   SCOTT    3000
 9   KING     5000
10   TURNER   1500
11   ADAMS    1100
12   JAMES     950
13   FORD     3000
14   MILLER   1300
```

A



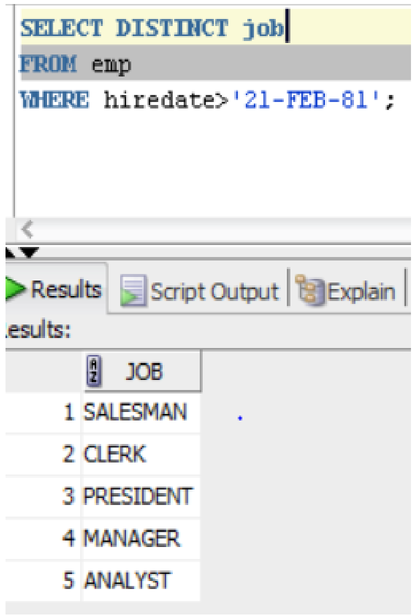
```
SELECT JOB
FROM emp
WHERE hiredate>'21-FEB-81';
```

Results | Script Output | Explain

Results:

```
     JOB
 1   SALESMAN
 2   MANAGER
 3   SALESMAN
 4   MANAGER
 5   MANAGER
 6   ANALYST
 7   PRESIDENT
 8   SALESMAN
 9   CLERK
10   CLERK
11   ANALYST
12   CLERK
```

B



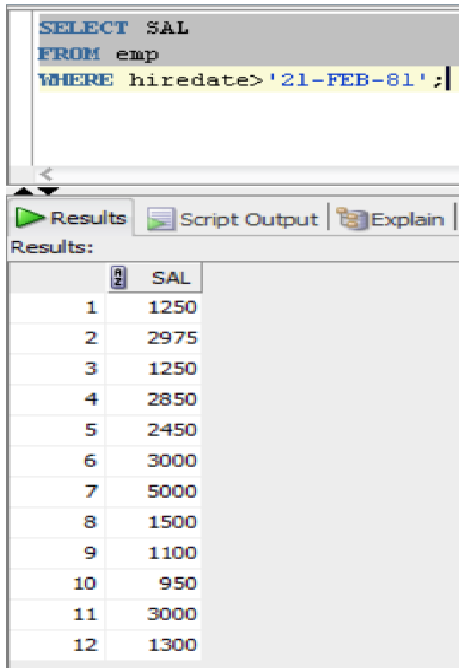
```
SELECT DISTINCT job
FROM emp
WHERE hiredate>'21-FEB-81';
```

Results | Script Output | Explain

Results:

```
    JOB
1   SALESMAN
2   CLERK
3   PRESIDENT
4   MANAGER
5   ANALYST
```

C



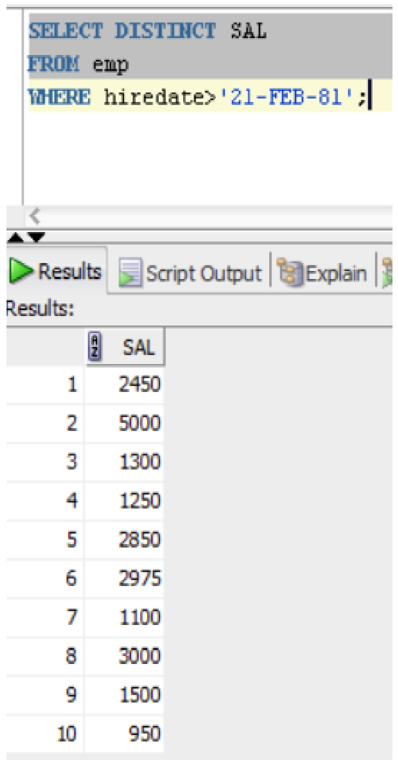
```
SELECT SAL
FROM emp
WHERE hiredate>'21-FEB-81';
```

Results | Script Output | Explain

Results:

```
      SAL
 1   1250
 2   2975
 3   1250
 4   2850
 5   2450
 6   3000
 7   5000
 8   1500
 9   1100
10    950
11   3000
12   1300
```

D



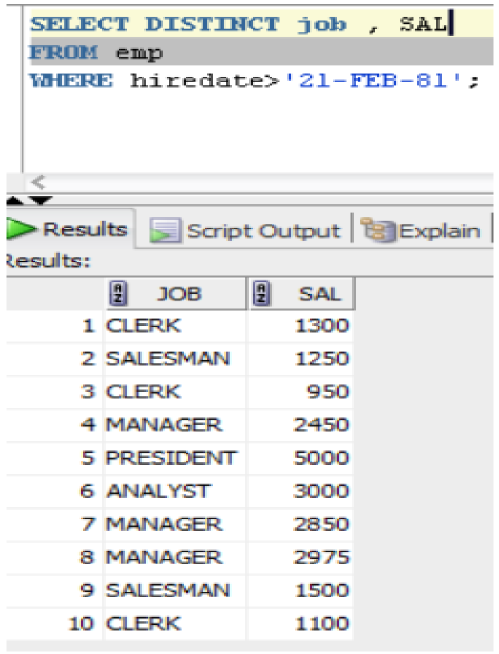
```
SELECT DISTINCT SAL
FROM emp
WHERE hiredate>'21-FEB-81';
```

Results | Script Output | Explain

Results:

```
      SAL
 1   2450
 2   5000
 3   1300
 4   1250
 5   2850
 6   2975
 7   1100
 8   3000
 9   1500
10    950
```

E



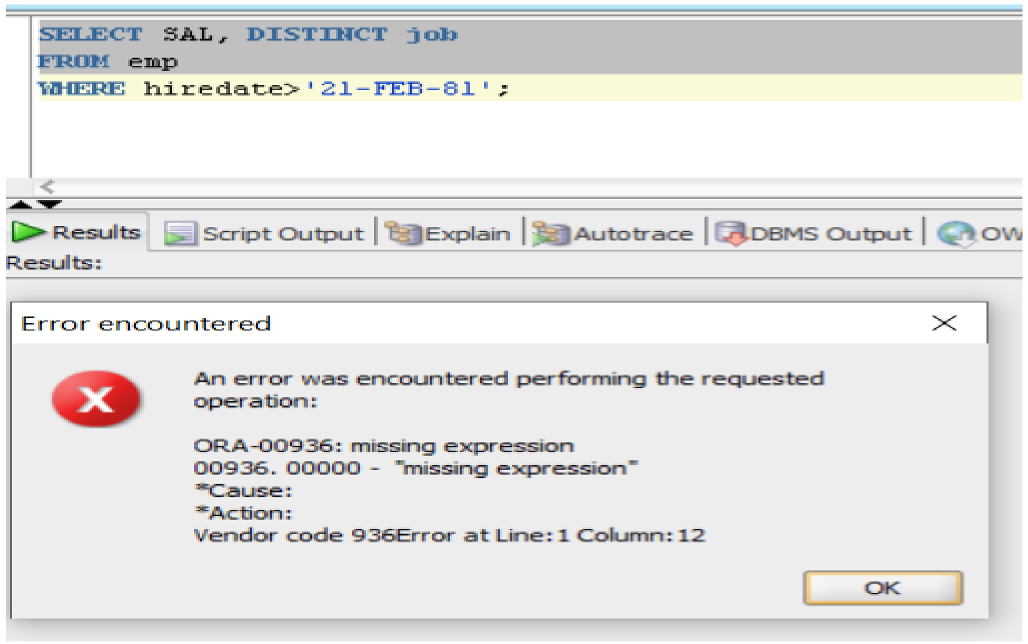
```
SELECT DISTINCT job , SAL
FROM emp
WHERE hiredate>'21-FEB-81';
```

Results | Script Output | Explain

Results:

```
     JOB         SAL
 1   CLERK       1300
 2   SALESMAN    1250
 3   CLERK        950
 4   MANAGER     2450
 5   PRESIDENT   5000
 6   ANALYST     3000
 7   MANAGER     2850
 8   MANAGER     2975
 9   SALESMAN    1500
10   CLERK       1100
```

F



```
SELECT SAL, DISTINCT job
FROM emp
WHERE hiredate>'21-FEB-81';
```

Results | Script Output | Explain | Autotrace | DBMS Output | OW

Results:

Error encountered

```
An error was encountered performing the requested
operation:

ORA-00936: missing expression
00936. 00000 -  "missing expression"
*Cause:
*Action:
Vendor code 936Error at Line:1 Column:12
```

OK

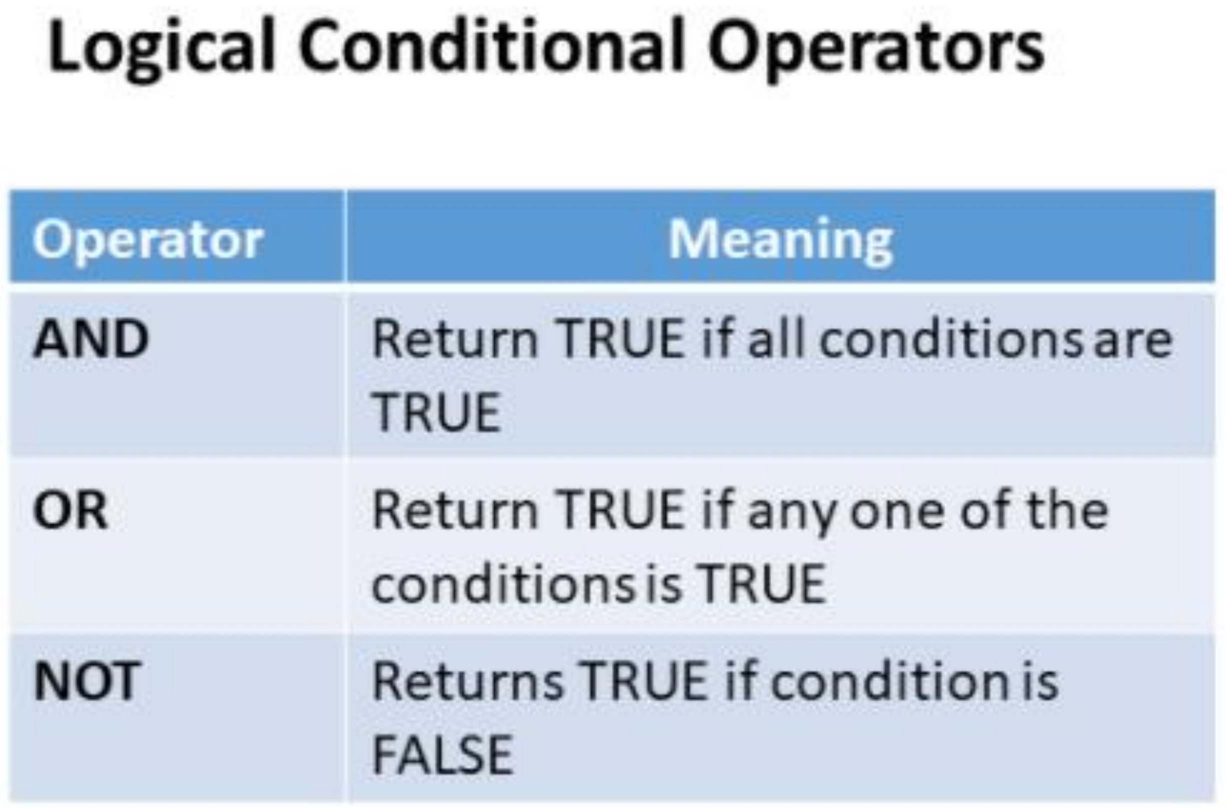
LOGICAL OPERATORS

SYNTAX (AND):

```
SELECT column1, column2,..
FROM table_name
WHERE condition1 AND condition2 ;
```

SYNTAX (OR):

```
SELECT column1, column2,..
FROM table_name
WHERE condition1 OR condition2 ;
```



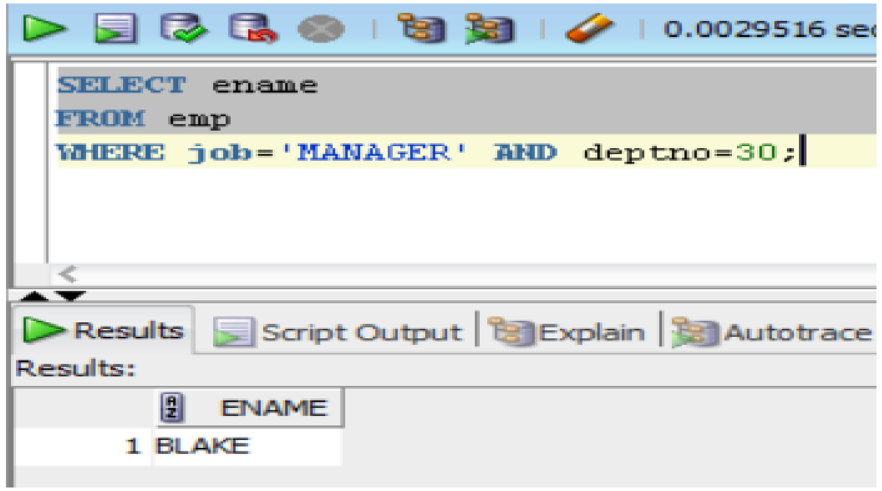
Logical Conditional Operators

Operator	Meaning
AND	Return TRUE if all conditions are TRUE
OR	Return TRUE if any one of the conditions is TRUE
NOT	Returns TRUE if condition is FALSE

EXAMPLE O:

Find names of employees whose job is MANAGER and belong to department 30.

```
SELECT ename
FROM emp
WHERE job = 'MANAGER' AND deptno = 30 ;
```



```
SELECT ename
FROM emp
WHERE job='MANAGER' AND deptno=30;
```

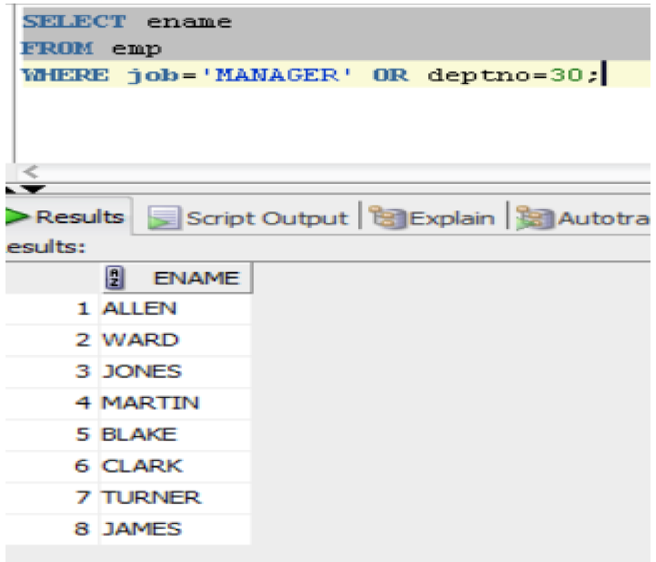
Results:

	ENAME
1	BLAKE

EXAMPLE P:

Find names of employees whose job is MANAGER or belong to department 30.

```
SELECT ename
FROM emp
WHERE job = 'MANAGER' OR deptno = 30 ;
```



```
SELECT ename
FROM emp
WHERE job='MANAGER' OR deptno=30;
```

esults:

	ENAME
1	ALLEN
2	WARD
3	JONES
4	MARTIN
5	BLAKE
6	CLARK
7	TURNER
8	JAMES

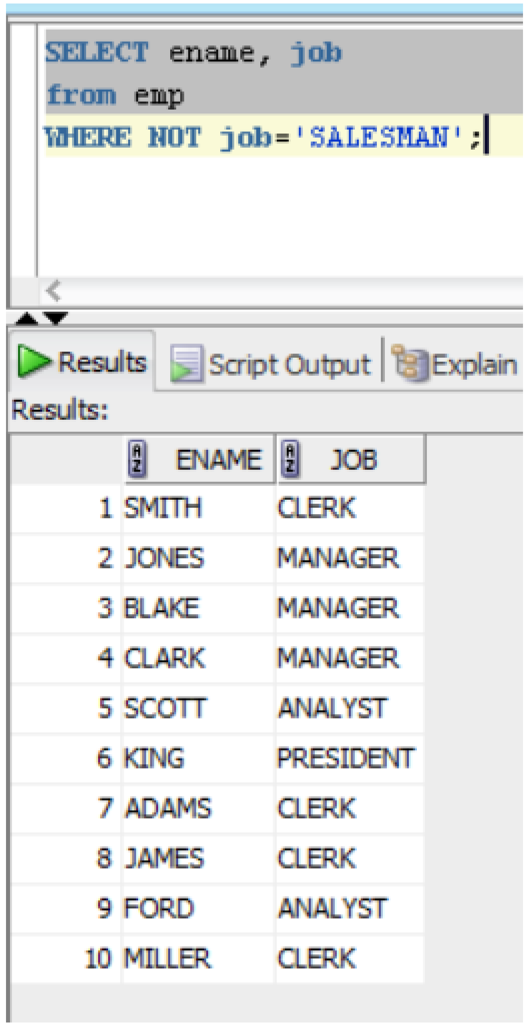
SYNTAX (NOT):

```
SELECT column1 , column2, ...
FROM table_name
WHERE NOT condition ;
```

EXAMPLE Q:

Find all the employees whose job is not SALESMAN

```
SELECT ename , job
FROM emp
WHERE NOT job = 'SALESMAN';
```



```
SELECT ename, job
from emp
WHERE NOT job='SALESMAN';
```

Results:

```
    ENAME   JOB
 1  SMITH   CLERK
 2  JONES   MANAGER
 3  BLAKE   MANAGER
 4  CLARK   MANAGER
 5  SCOTT   ANALYST
 6  KING    PRESIDENT
 7  ADAMS   CLERK
 8  JAMES   CLERK
 9  FORD    ANALYST
10  MILLER  CLERK
```

TASK C

- **Find all employees whose job is not CLERK and belong to department 20.**

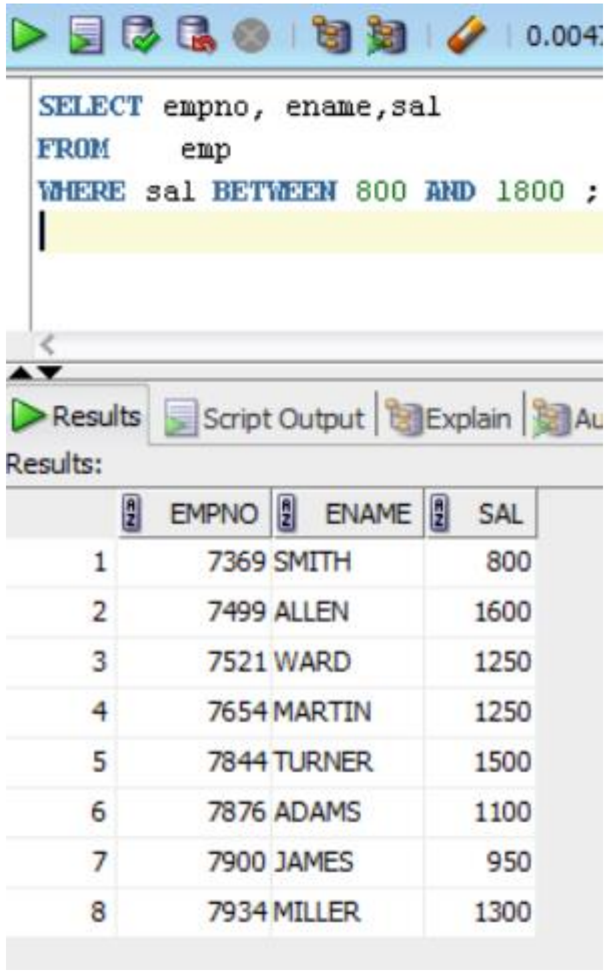
- **Display the employee’s name , job title & salary based on the following criteria:**
  a) If the employee is a salesman, then he should be included in the O/P
  b) If the employee is a manager, then his salary package must be above 2450.

- **Display employee’s name , Job titles & salary if the employee is either a salesman or a manager & earns more than 2450.**

[NOT] BETWEEN lower_range AND upper_range

EXAMPLE R:

```
SELECT empno, ename, sal
FROM    emp
WHERE sal BETWEEN 800 AND 1800 ;
```



0.004

```
SELECT empno, ename,sal
FROM    emp
WHERE sal BETWEEN 800 AND 1800 ;
```

Results:

	EMPNO	ENAME	SAL
1	7369	SMITH	800
2	7499	ALLEN	1600
3	7521	WARD	1250
4	7654	MARTIN	1250
5	7844	TURNER	1500
6	7876	ADAMS	1100
7	7900	JAMES	950
8	7934	MILLER	1300

[NOT] LIKE (CHARACTER PATTERN)

LIKE uses two wildcards such as percentage (%) and underscore (_) to represent the number of characters in the pattern.

Patterns are case-sensitive.

% means any zero, one, or multiple characters

• %M%	Match any string having M in any position
• M%	Match value having M at start
• %M	Match value having M at end
• M%A	Start with M and end with A

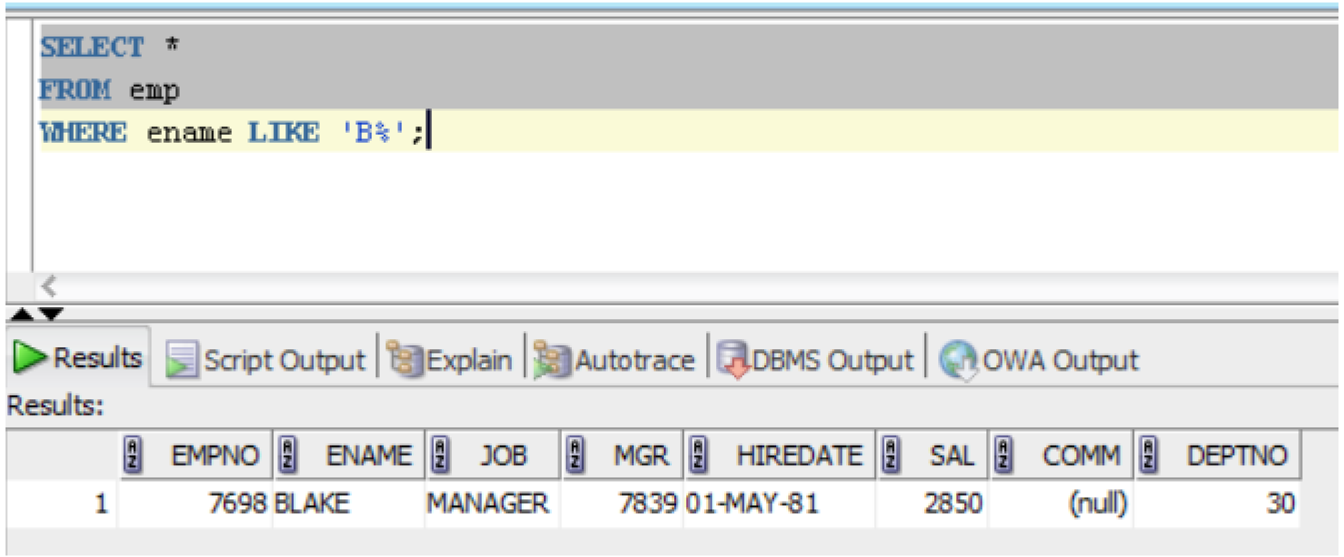
_ specifies the number of unknown characters before or after the known character. One underscore is one character.

• _r%	Match value having r in the second position

EXAMPLE S:

Get names of all employees whose names start with 'B'.

```
SELECT *
FROM    emp
WHERE ename LIKE 'B%' ;
```



```
SELECT *
FROM emp
WHERE ename LIKE 'B%';
```

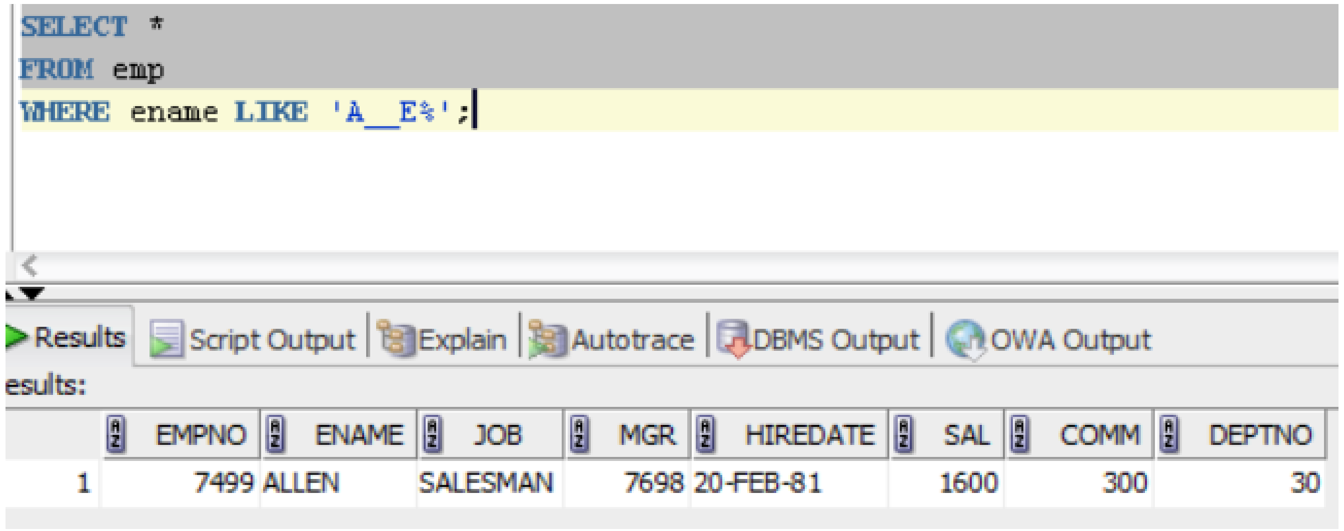
Results:

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
1	7698	BLAKE	MANAGER	7839	01-MAY-81	2850	(null)	30

EXAMPLE T:

Get names of all employees whose names start with an 'A' and has 'E' in the fourth position.

```
SELECT *
FROM    emp
WHERE ename LIKE 'A __ E%' ;
```



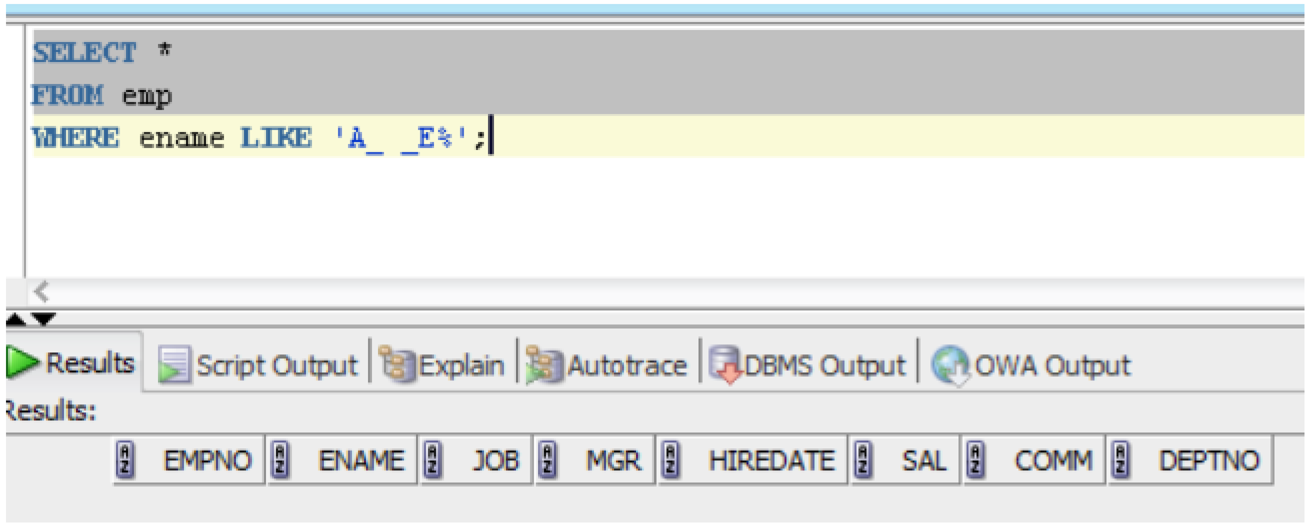
```
SELECT *
FROM emp
WHERE ename LIKE 'A__E%';
```

esults:

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
1	7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30

EXAMPLE U:

```
SELECT *
FROM    emp
WHERE ename LIKE 'A _ _ E%'
```



```
SELECT *
FROM emp
WHERE ename LIKE 'A_ _E%';
```

Results:

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO

TASK D

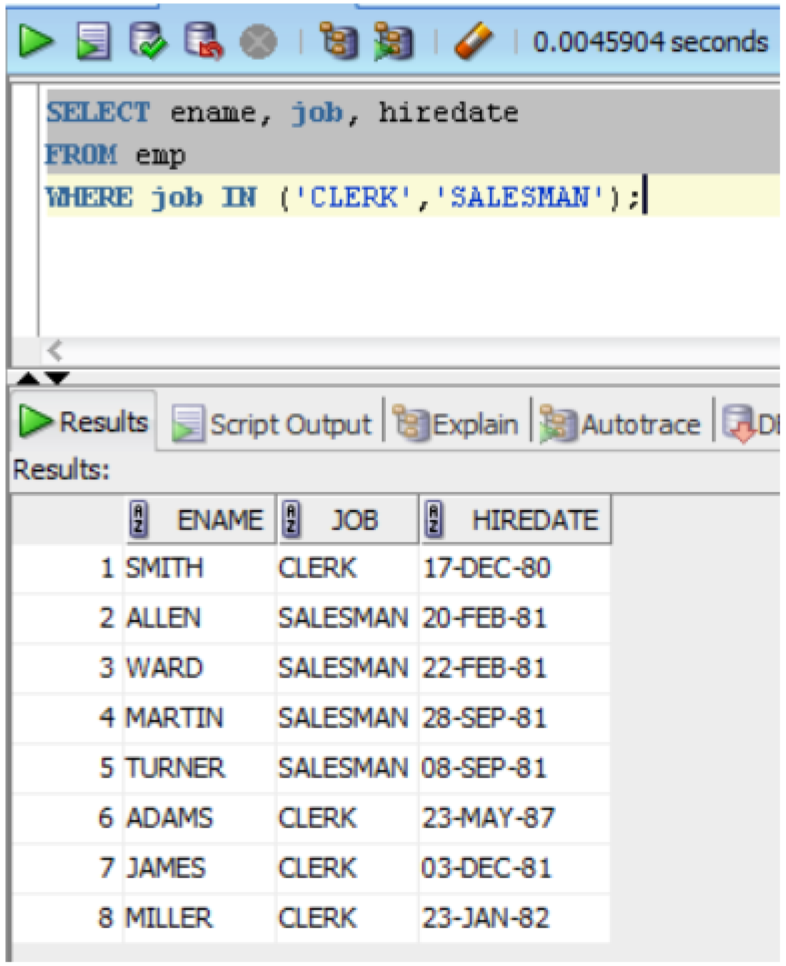
- List the employees having at least two A’s in their names.
- List the employees whose names start with S and end at H.
- List the employee whose name has E as the second character.
- Display employ number and job title of all employees who have a job title that contain the string ‘MAN’ & earn more than 10,000.

[NOT] IN(value1,value2, value3,..)

- The **IN** operator can take one, two or multiple values and allows you to match a column to the given values in parentheses in the WHERE clause.

EXAMPLE V:

```
SELECT ename, job, hiredate
FROM emp
WHERE job IN ('CLERK','SALESMAN’) ;
```



```
SELECT ename, job, hiredate
FROM emp
WHERE job IN ('CLERK','SALESMAN');
```

	ENAME	JOB	HIREDATE
1	SMITH	CLERK	17-DEC-80
2	ALLEN	SALESMAN	20-FEB-81
3	WARD	SALESMAN	22-FEB-81
4	MARTIN	SALESMAN	28-SEP-81
5	TURNER	SALESMAN	08-SEP-81
6	ADAMS	CLERK	23-MAY-87
7	JAMES	CLERK	03-DEC-81
8	MILLER	CLERK	23-JAN-82

TASK E

Display list of employees who are either a clerk or an analyst & who do not earn 1000, 3000,5000.

IS [NOT] NULL

IS NULL is used to check for NULL values in a given attribute.

EXAMPLE W:

Find all employees who don't earn commission.

SELECT ename, job, sal

FROM emp

WHERE comm IS NULL ;

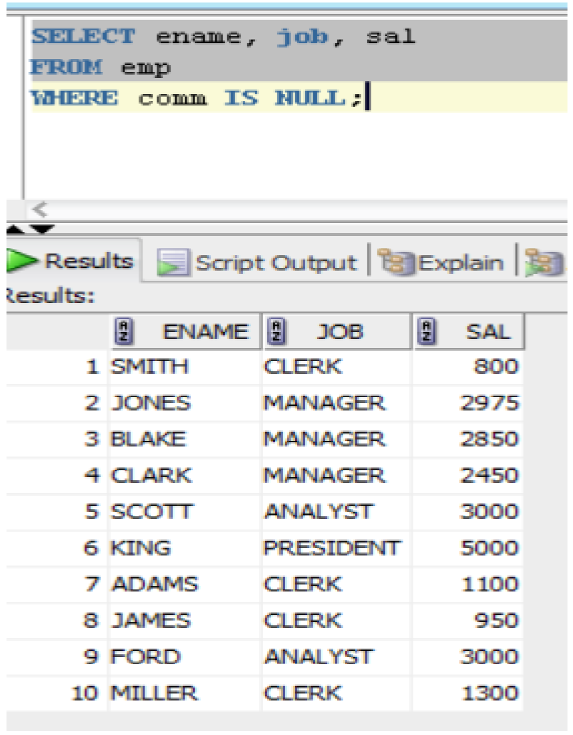
EXAMPLE X:

Find all employees who earn commission.

SELECT ename, job, sal

FROM emp

WHERE comm IS NOT NULL ;

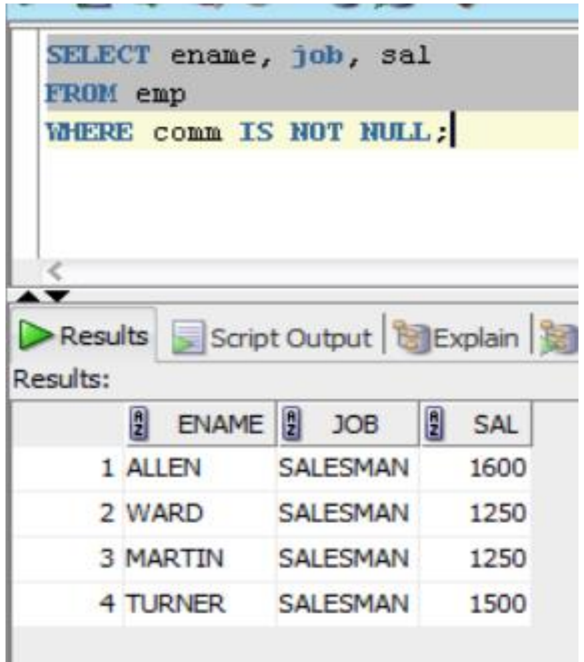


```
SELECT ename, job, sal
FROM emp
WHERE comm IS NULL;
```

Results | Script Output | Explain

Results:

	ENAME	JOB	SAL
1	SMITH	CLERK	800
2	JONES	MANAGER	2975
3	BLAKE	MANAGER	2850
4	CLARK	MANAGER	2450
5	SCOTT	ANALYST	3000
6	KING	PRESIDENT	5000
7	ADAMS	CLERK	1100
8	JAMES	CLERK	950
9	FORD	ANALYST	3000
10	MILLER	CLERK	1300



```
SELECT ename, job, sal
FROM emp
WHERE comm IS NOT NULL;
```

Results | Script Output | Explain

Results:

	ENAME	JOB	SAL
1	ALLEN	SALESMAN	1600
2	WARD	SALESMAN	1250
3	MARTIN	SALESMAN	1250
4	TURNER	SALESMAN	1500

ORDER BY CLAUSE

- **ORDER BY** clause is used for sorting the results of a query.
- Sorting can be done in ascending (ASC) or descending order (DESC).
- Default order is ascending **(0-10, A-Z, NULL in last)**.
- Descending order **(10-0, Z-A, NULL at first).**
- Sorting can be done using a single column or multiple columns.
- You can also order by aliases that you specify in SELECT clause.
- **ORDER BY** clause is always the last clause of the SELECT statement.

EXAMPLE Y:

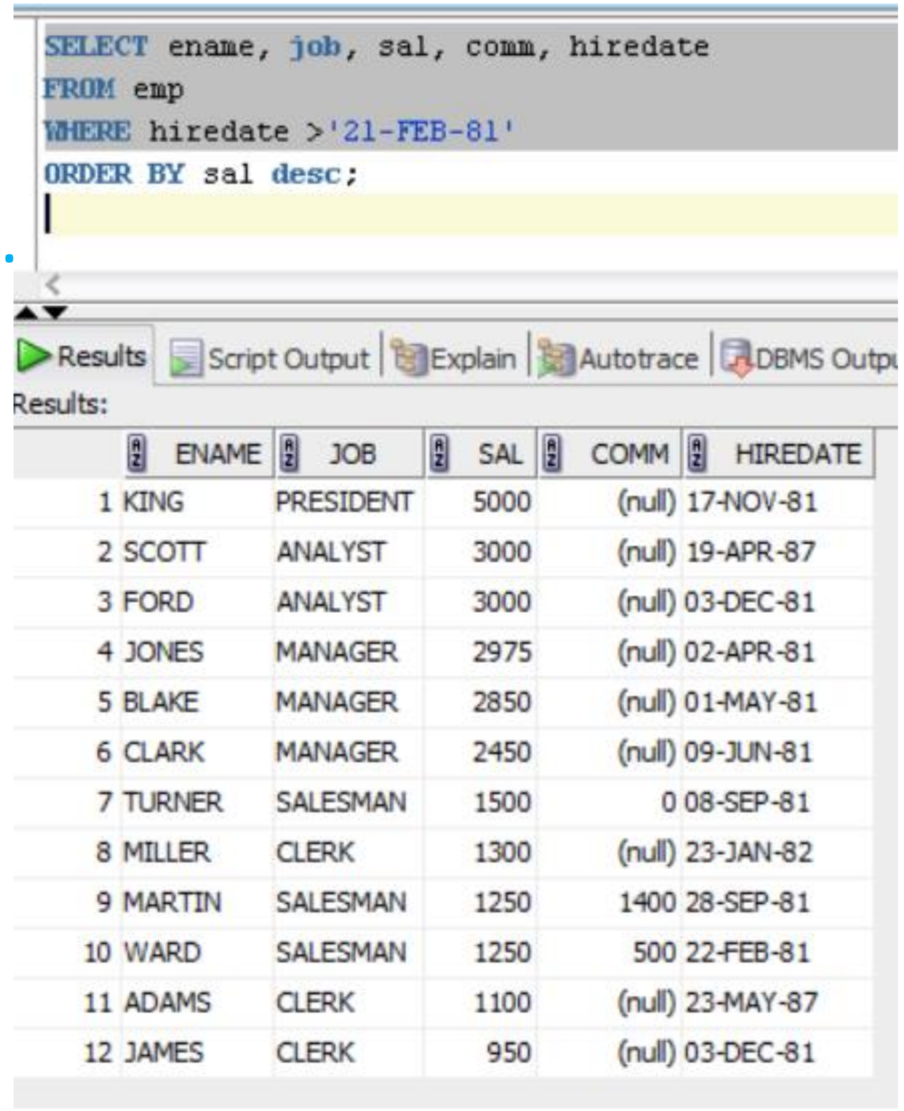
Find all employees who were hired after 21st Feb 1981 and display them based on highest pay scales.

SELECT ename, job, sal , comm , hiredate

FROM emp

WHERE hiredate > **'21-FEB-81'**

ORDER BY sal **DESC ;**



```
SELECT ename, job, sal, comm, hiredate
FROM emp
WHERE hiredate >'21-FEB-81'
ORDER BY sal desc;
```

Results:

	ENAME	JOB	SAL	COMM	HIREDATE
1	KING	PRESIDENT	5000	(null)	17-NOV-81
2	SCOTT	ANALYST	3000	(null)	19-APR-87
3	FORD	ANALYST	3000	(null)	03-DEC-81
4	JONES	MANAGER	2975	(null)	02-APR-81
5	BLAKE	MANAGER	2850	(null)	01-MAY-81
6	CLARK	MANAGER	2450	(null)	09-JUN-81
7	TURNER	SALESMAN	1500	0	08-SEP-81
8	MILLER	CLERK	1300	(null)	23-JAN-82
9	MARTIN	SALESMAN	1250	1400	28-SEP-81
10	WARD	SALESMAN	1250	500	22-FEB-81
11	ADAMS	CLERK	1100	(null)	23-MAY-87
12	JAMES	CLERK	950	(null)	03-DEC-81

EXAMPLE Z:

Sort employees first by their deptno in ascending order and then names in descending.

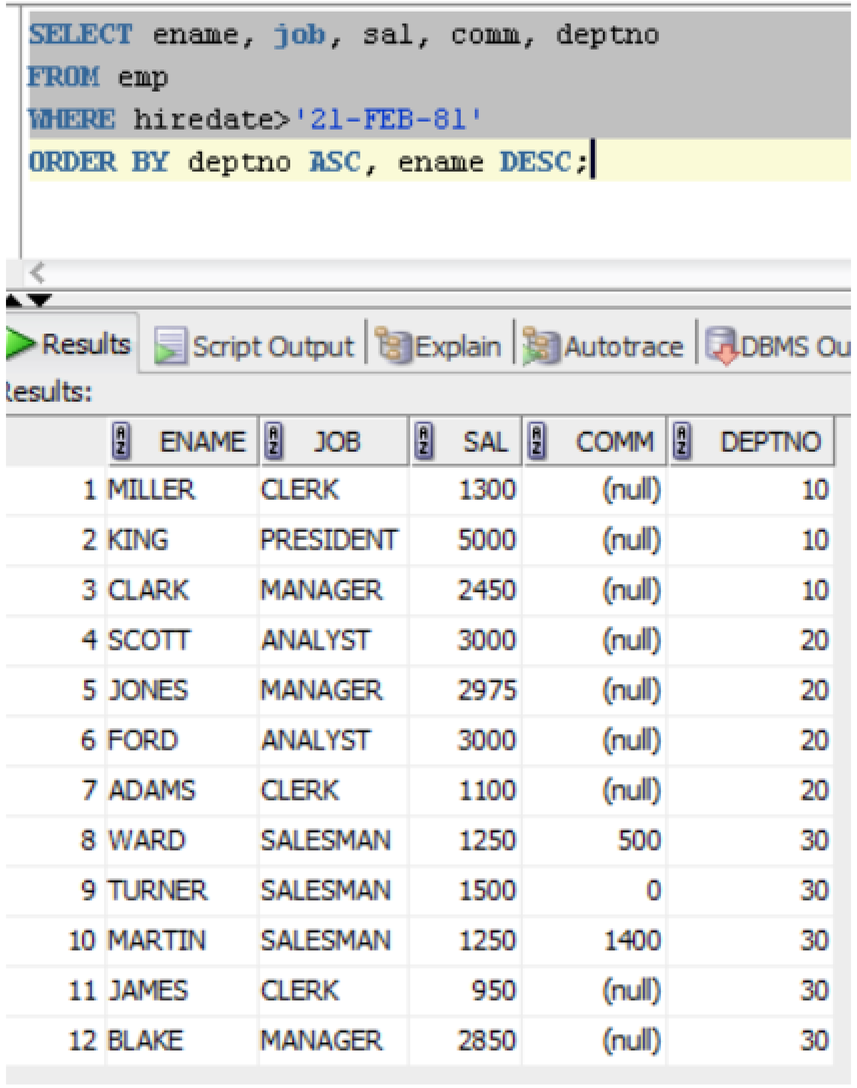
SELECT ename, job, sal , comm , deptno

FROM emp

WHERE hiredate > ’21-FEB-81’

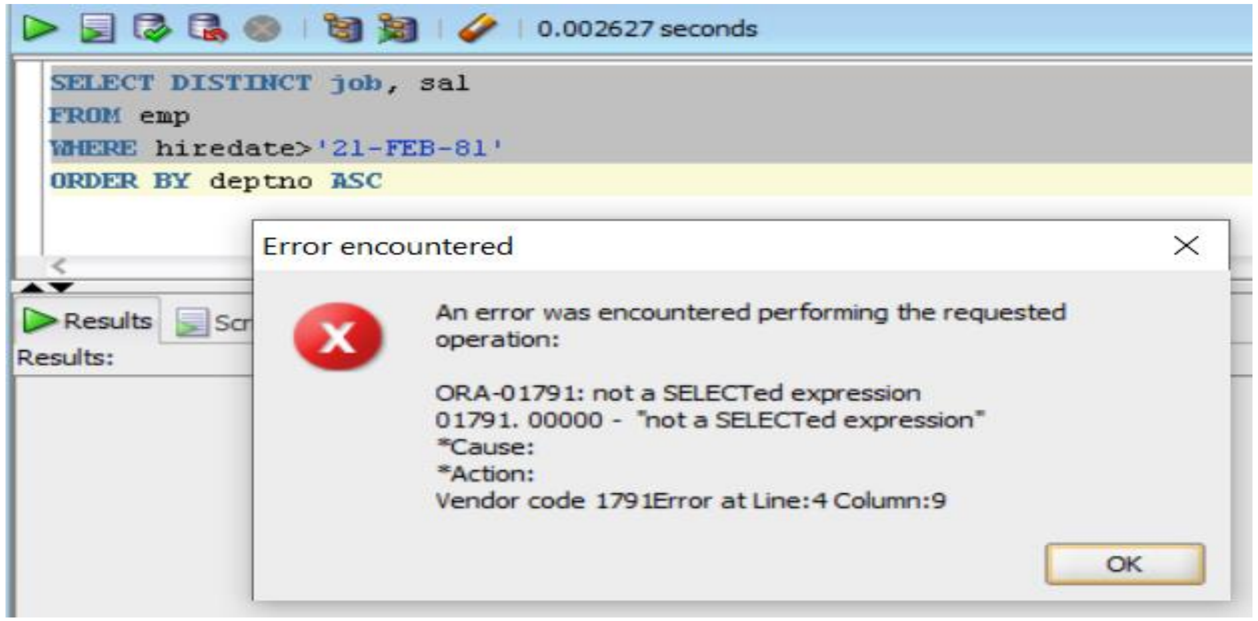
ORDER BY deptno ASC , ename DESC ;

- If multiple columns are listed in the order by clause, then the first listed column is called the PRIMARY SORT and the others are called SECONDARY SORT.
- Sort order applies to the column after which it was listed.
- If UNIQUE or DISTINCT is used, then sorting must be done with only those columns that are listed in the SELECT clause.



```
SELECT ename, job, sal, comm, deptno
FROM emp
WHERE hiredate>'21-FEB-81'
ORDER BY deptno ASC, ename DESC;
```

	ENAME	JOB	SAL	COMM	DEPTNO
1	MILLER	CLERK	1300	(null)	10
2	KING	PRESIDENT	5000	(null)	10
3	CLARK	MANAGER	2450	(null)	10
4	SCOTT	ANALYST	3000	(null)	20
5	JONES	MANAGER	2975	(null)	20
6	FORD	ANALYST	3000	(null)	20
7	ADAMS	CLERK	1100	(null)	20
8	WARD	SALESMAN	1250	500	30
9	TURNER	SALESMAN	1500	0	30
10	MARTIN	SALESMAN	1250	1400	30
11	JAMES	CLERK	950	(null)	30
12	BLAKE	MANAGER	2850	(null)	30

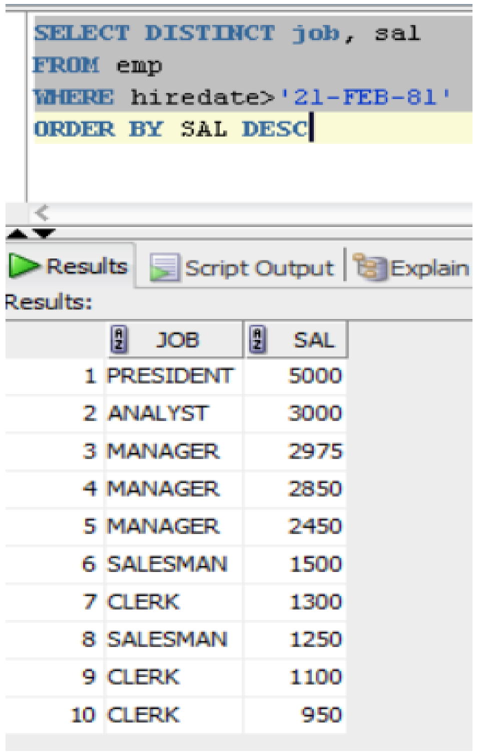


0.002627 seconds

```sql
SELECT DISTINCT job, sal
FROM emp
WHERE hiredate>'21-FEB-81'
ORDER BY deptno ASC
```

Error encountered

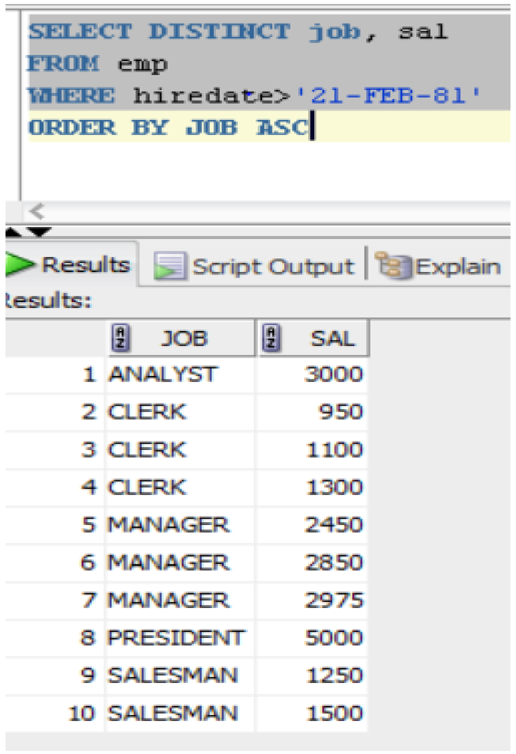
```
An error was encountered performing the requested
operation:

ORA-01791: not a SELECTed expression
01791. 00000 -  "not a SELECTed expression"
*Cause:
*Action:
Vendor code 1791Error at Line:4 Column:9
```



```sql
SELECT DISTINCT job, sal
FROM emp
WHERE hiredate>'21-FEB-81'
ORDER BY SAL DESC
```

Results:

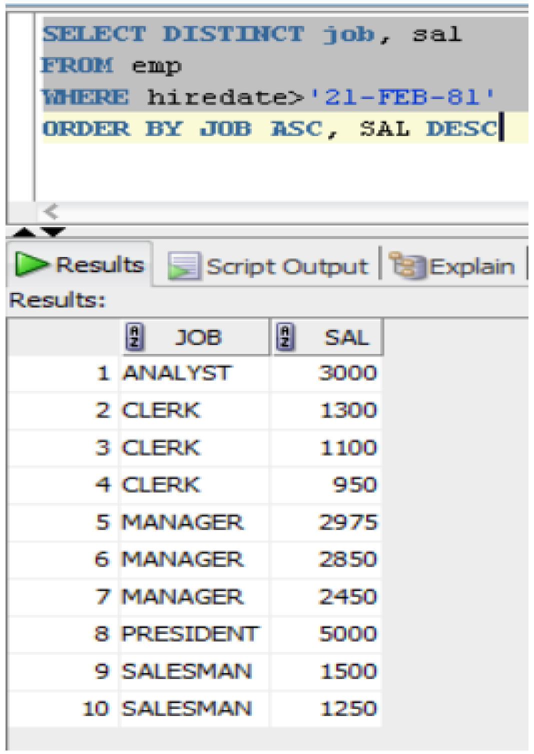
	JOB	SAL
1	PRESIDENT	5000
2	ANALYST	3000
3	MANAGER	2975
4	MANAGER	2850
5	MANAGER	2450
6	SALESMAN	1500
7	CLERK	1300
8	SALESMAN	1250
9	CLERK	1100
10	CLERK	950



```sql
SELECT DISTINCT job, sal
FROM emp
WHERE hiredate>'21-FEB-81'
ORDER BY JOB ASC
```

Results:

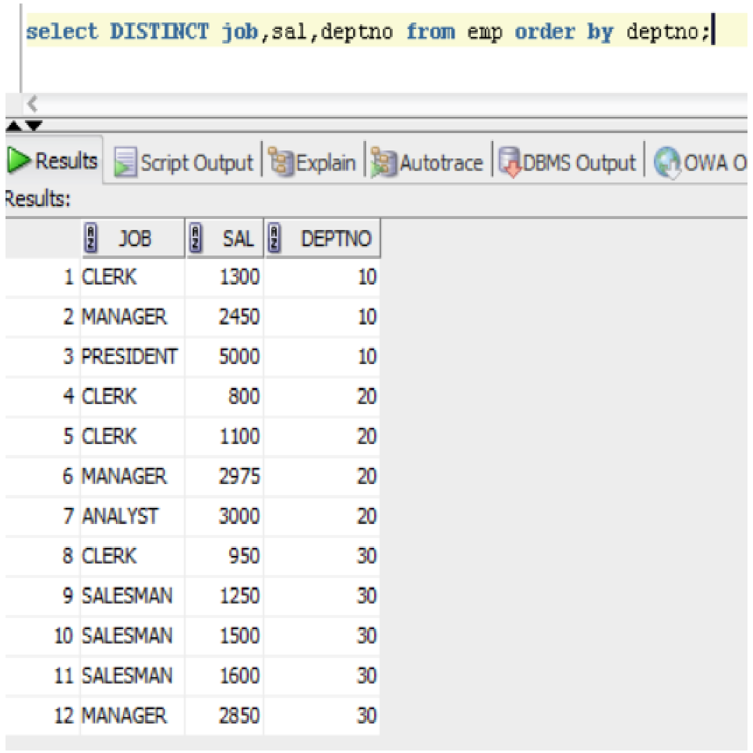
	JOB	SAL
1	ANALYST	3000
2	CLERK	950
3	CLERK	1100
4	CLERK	1300
5	MANAGER	2450
6	MANAGER	2850
7	MANAGER	2975
8	PRESIDENT	5000
9	SALESMAN	1250
10	SALESMAN	1500



```sql
SELECT DISTINCT job, sal
FROM emp
WHERE hiredate>'21-FEB-81'
ORDER BY JOB ASC, SAL DESC
```

Results:

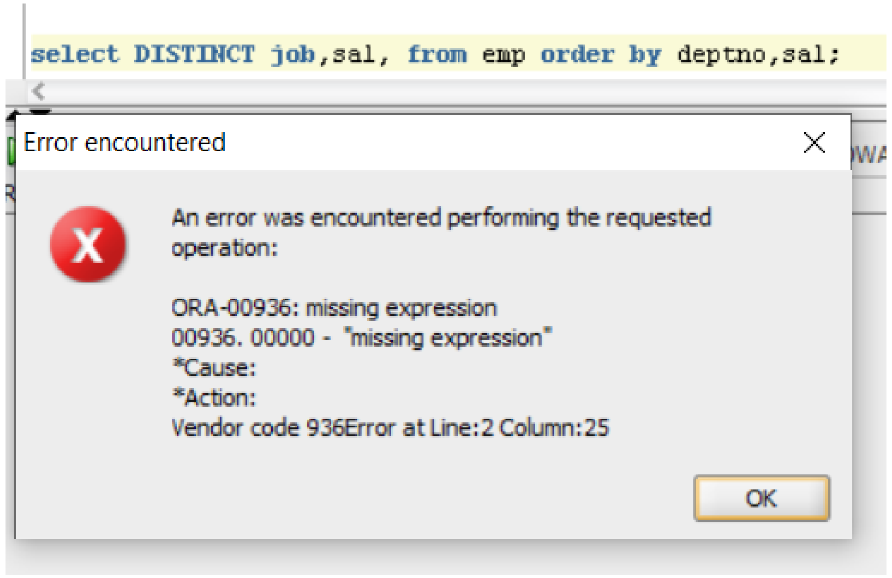
	JOB	SAL
1	ANALYST	3000
2	CLERK	1300
3	CLERK	1100
4	CLERK	950
5	MANAGER	2975
6	MANAGER	2850
7	MANAGER	2450
8	PRESIDENT	5000
9	SALESMAN	1500
10	SALESMAN	1250



```sql
select DISTINCT job,sal,deptno from emp order by deptno;
```

Results:

	JOB	SAL	DEPTNO
1	CLERK	1300	10
2	MANAGER	2450	10
3	PRESIDENT	5000	10
4	CLERK	800	20
5	CLERK	1100	20
6	MANAGER	2975	20
7	ANALYST	3000	20
8	CLERK	950	30
9	SALESMAN	1250	30
10	SALESMAN	1500	30
11	SALESMAN	1600	30
12	MANAGER	2850	30



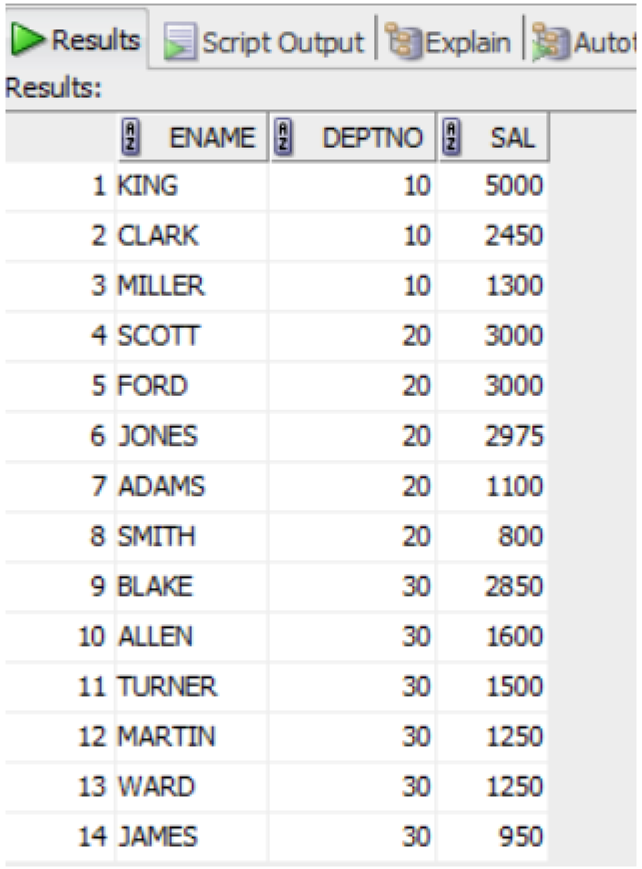
```sql
select DISTINCT job,sal, from emp order by deptno,sal;
```

Error encountered

```
An error was encountered performing the requested
operation:

ORA-00936: missing expression
00936. 00000 -  "missing expression"
*Cause:
*Action:
Vendor code 936Error at Line:2 Column:25
```

TASK F

- Display the names of employees according to their seniority.
- Display names and annual salary of all employees, also sort the result based on annual salary in descending order.
- Write a query which produces the following output.



Results:

	ENAME	DEPTNO	SAL
1	KING	10	5000
2	CLARK	10	2450
3	MILLER	10	1300
4	SCOTT	20	3000
5	FORD	20	3000
6	JONES	20	2975
7	ADAMS	20	1100
8	SMITH	20	800
9	BLAKE	30	2850
10	ALLEN	30	1600
11	TURNER	30	1500
12	MARTIN	30	1250
13	WARD	30	1250
14	JAMES	30	950