

## SQL Database Programming: Section 1-3 Anatomy of a SQL Statement

### Vocabulary

Join	Display data from two or more related tables.
Operator	A symbol used to perform an operation on some values.
Column	An implementation of an attribute or relationship in a table.
Projection	The capability in SQL to choose the columns in a table that you want returned from a query.
Null	A value that is unavailable, unassigned, unknown, or inapplicable.
Alias	Renames a column heading.
Expression	A mathematical equation.
Selection	The capability in SQL to choose the rows in a table returned from a query.
Query	Retrieves information from the database
SELECT statement	Specifies the columns to be displayed
FROM	Specifies the table containing the column listed in the select clause
Statement	An individual SQL command
Clause	Part of a SQL statement
Compound	A combination of the two clauses

### Try It / Solve It

Now you know the basics of a SELECT statement, It's time to practice what you've learned.

- 1) Write a SQL statement that demonstrates projection.

```
SELECT MAILING_ADDRESS  
FROM CUSTOMERS
```

- 2) Write a query that displays the last\_name and email addresses for all the people in the DJs on Demand d\_client table. The column headings should appear as “Client” and “Email Address.”

The screenshot shows the APEX SQL Workshop interface. The SQL command is:

```
SELECT
  last_name AS "Client",
  email AS "Email Address"
FROM d_clients;
```

The results are displayed in a table with two columns: Client and Email Address.

Client	Email Address
Peters	hpeters@yahoo.com
Jones	serena.jones@jones.com
Vigil	lbv@lbv.net

3 rows returned in 0.01 seconds

- 3) The manager of Global Fast Foods decided to give all employees at 5%/hour raise + a \$.50 bonus/hour. However, when he looked at the results, he couldn't figure out why the new raises were not as he predicted. Ms. Doe should have a new salary of \$7.59, Mr. Miller's salary should be \$11.00, and Monique Tuttle should be \$63.50. He used the following query. What should he have done?

```
SELECT last_name, salary *.05 + .50
FROM f_staffs;
```

The screenshot shows the APEX SQL Workshop interface. The SQL command is:

```
SELECT
  last_name, (salary + 0.50) * 1.05
FROM f_staffs;
```

The results are displayed in a table with two columns: LAST\_NAME and (SALARY+0.50)\*1.05.

LAST_NAME	(SALARY+0.50)*1.05
Doe	7.6125
Miller	11.025
Tuttle	63.525

3 rows returned in 0.00 seconds

- 4) Which of the following would be the easiest way to see all rows in the d\_songs table?
- SELECT id, title, duration, artist, type\_code
  - SELECT columns
  - SELECT \*
  - SELECT all
- 5) If  $\text{tax} = 8.5\% * \text{car\_cost}$  and  $\text{license} = \text{car\_cost} * .01\%$ , which value will produce the largest car payment?
- Payment =  $(\text{car\_cost} * 1.25) + 5.00 - (\text{tax}) - (\text{license})$
  - Payment =  $\text{car\_cost} * 1.25 + 5.00 - (\text{tax} - \text{license})$
- 6) In the example below, identify the keywords, the clause(s), and the statement(s):
- ```
SELECT employee_id, last_name
FROM employees
```
- KEYWORDS: SELECT, FROM  
 CLAUSE(S): SELECT employee\_id, last\_name [AND] FROM employees  
 STATEMENT(S): SELECT employee\_id, last\_name  
 FROM employees;
- 7) Label each example as SELECTION or PROJECTION.
- Please give me Mary Adam's email address. → SELECTION
  - I would like only the manager\_id column, and none of the other columns. → PROJECTION
- 8) Which of the following statements are true?
- $\text{null} * 25 = 0$ ;
  - $\text{null} * 6.00 = 6.00$
  - $\text{null} * .05 = \text{null}$
  - $(\text{null} + 1.00) + 5.00 = 5.00$
- 9) How will the column headings be labeled in the following example?
- ```
SELECT bear_id bears, color AS Color, age "age"
FROM animals;
```
- bears, color, age
  - BEARS, COLOR, AGE
  - BEARS, COLOR, age
  - Bears, Color, Age
- 10) Which of the following words must be in a SELECT statement in order to return all rows?
- SELECT only
  - SELECT and FROM
  - FROM only
  - SELECT \* only

---

## SQL Database Programming: Section 2-1 Working with Columns, Characters, and Rows

### Vocabulary

DISTINCT – a command that suppresses duplicates

CONCATENATION – links two columns together to form one character data column

DESCRIBE – an SQL plus command that displays the structure of a table

### Try It/Solve It

1) The manager of Global Fast Foods would like to send out coupons for the upcoming sale. He wants to send one coupon to each household. Create the SELECT statement that returns the customer last name and a mailing address.

```
SELECT LAST_NAME  
FROM CUSTOMERS;
```

```
SELECT MAILING_ADDRESS  
FROM CUSTOMERS;
```

2) Correct the errors and execute the query in Oracle Application Express.

a. SELECT “first\_name”  
FROM f\_staffs;

b. SELECT first\_name || ‘ ‘ || last\_name AS “DJs on Demand Clients”  
FROM d\_clients;

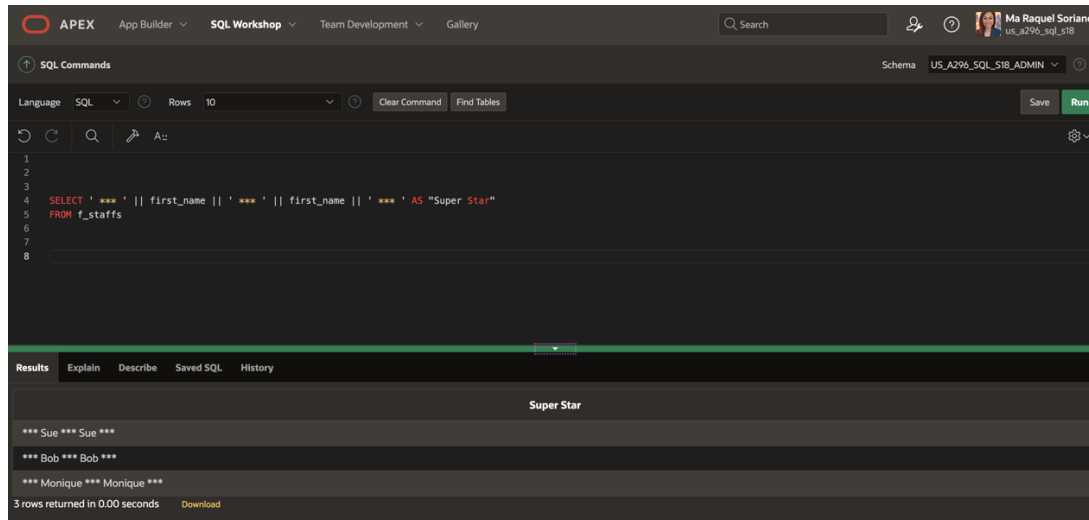
c. SELECT DISTINCT order\_line\_id  
FROM f\_order\_lines;

d. SELECT “order\_number”  
FROM f\_orders;

3) Sue, Bob, and Monique were the employees of the month. Using the f\_staffs table, create a SELECT statement to display the results as shown in the Super Star chart.

Super Star		
*** Sue ***	Sue	***
*** Bob ***	Bob	***
*** Monique ***	Monique	***

Unable to perform the exact Super Star chart output as described because SQL command requires a table formatted style for me to retrieve data for the chart. However, to display the employee name, this query is to be performed.



4) Which of the following is TRUE about the following query?

```
SELECT first_name, DISTINCT birthdate
FROM f_staffs;
```

- a. Only two rows will be returned.
- b. Four rows will be returned.
- c. Only Fred 05-Jan-1988 and
- d. No rows will be returned.

5) Global Fast Foods has decided to give all staff members a 5% raise. Prepare a report that presents the output as shown in the chart.

EMPLOYEE LAST NAME	CURRENT SALARY	SALARY WITH 5% RAISE

```
4  SELECT
5      LAST_NAME AS "EMPLOYEE LAST NAME",
6      SALARY AS "CURRENT SALARY",
7      SALARY * 1.05 AS SALARY WITH 5% RAISE"
8  FROM
9      f_staffs;
10
```

6) Create a query that will return the structure of the Oracle database EMPLOYEES table. Which columns are marked “nullable”? What does this mean?

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
EMPLOYEES	EMPLOYEE_ID	NUMBER	-	6	0	1	-	-	-
	FIRST_NAME	VARCHAR2	20	-	-	-	-	-	-
	LAST_NAME	VARCHAR2	25	-	-	-	-	-	-
	EMAIL	VARCHAR2	25	-	-	-	-	-	-
	PHONE_NUMBER	VARCHAR2	20	-	-	-	-	-	-
	HIRE_DATE	DATE	7	-	-	-	-	-	-
	JOB_ID	VARCHAR2	10	-	-	-	-	-	-
	SALARY	NUMBER	-	8	2	-	-	-	-

7) The owners of DJs on Demand would like a report of all items in their D\_CDs table with the following column headings: Inventory Item, CD Title, Music Producer, and Year Purchased. Prepare this report.

```

2
3  SELECT
4      INVENTORY_ITEMS AS "Inventory Item",
5      CD_TITLE AS "CD Title",
6      MUSIC_PRODUCER AS "Music Producer",
7      YEAR_PURCHASED AS "Yr Purchased"
8  FROM
9      D_CDs;
10

```

8) True/False -- The following SELECT statement executes successfully: → **TRUE**  
 SELECT last\_name, job\_id, salary AS Sal  
 FROM employees;

9) True/False -- The following SELECT statement executes successfully: → **TRUE** (assuming a 'job\_grades' table exists)  
 SELECT \*  
 FROM job\_grades;

10) There are four coding errors in this statement. Can you identify them?  
 SELECT employee\_id, last\_name  
 sal x 12 ANNUAL SALARY  
 FROM employees;

EMPLOYEE_ID	LAST_NAME	ANNUAL SALARY
100	King	288000
101	Kochhar	204000
102	De Haan	204000
200	Whalen	52800
205	Higgins	144000

11) In the arithmetic expression  $\text{salary} * 12 - 400$ , which operation will be evaluated first?

→ \* / multiplication

12) Which of the following can be used in the SELECT statement to return all columns of data in the Global Fast Foods f\_staffs table?

- a. column names
- b. \***
- c. DISTINCT id
- d. both a and b

13) Using SQL to choose the columns in a table uses which capability?

- a. selection
- b. projection**
- c. partitioning
- d. join

14) SELECT last\_name AS "Employee". The column heading in the query result will appear as:

- a. EMPLOYEE
- b. employee
- c. Employee**
- d. "Employee:

15) Which expression below will produce the largest value?

- a. SELECT salary\*6 + 100
- b. SELECT salary\* (6 + 100)**
- c. SELECT 6(salary+ 100)
- d. SELECT salary+6\*100

16) Which statement below will return a list of employees in the following format? Mr./Ms. Steven King is an employee of our company.

- a. `SELECT "Mr./Ms." || first_name || ' ' || last_name 'is an employee of our company.' AS "Employees"`  
`FROM employees;`
- b. `SELECT 'Mr./Ms. ' || first_name || last_name || ' ' || 'is an employee of our company.'`  
`FROM employees;`
- c. `SELECT 'Mr./Ms. ' || first_name || ' ' || last_name || ' ' || 'is an employee of our company.' AS "Employees"`  
`FROM employees ;`
- d. `SELECT Mr./Ms. || first_name || ' ' || last_name || ' ' || "is an employee of our company." AS "Employees"`  
`FROM employees`

17) Which is true about SQL statements?

- a. SQL statements are case-sensitive
- b. SQL clauses should not be written on separate lines.
- c. **Keywords cannot be abbreviated or split across lines.**
- d. SQL keywords are typically entered in lowercase; all other words in uppercase.

18) Which queries will return three columns each with UPPERCASE column headings?

- a. `SELECT "Department_id", "Last_name", "First_name"`  
`FROM employees;`
- b. `SELECT DEPARTMENT_ID, LAST_NAME, FIRST_NAME`  
`FROM employees;`
- c. `SELECT department_id, last_name, first_name AS UPPER CASE`  
`FROM employees`
- d. `SELECT department_id, last_name, first_name`  
`FROM employees;`

19) Which statement below will likely fail?

- a. `SELECT * FROM employees;`
- b. `Select * FROM employees;`
- c. `SELECT * FROM EMPLOYEES;`
- d. `SelecT* FROM employees;`

---

## SQL Database Programming: Section 2-2 Limit Rows Selected

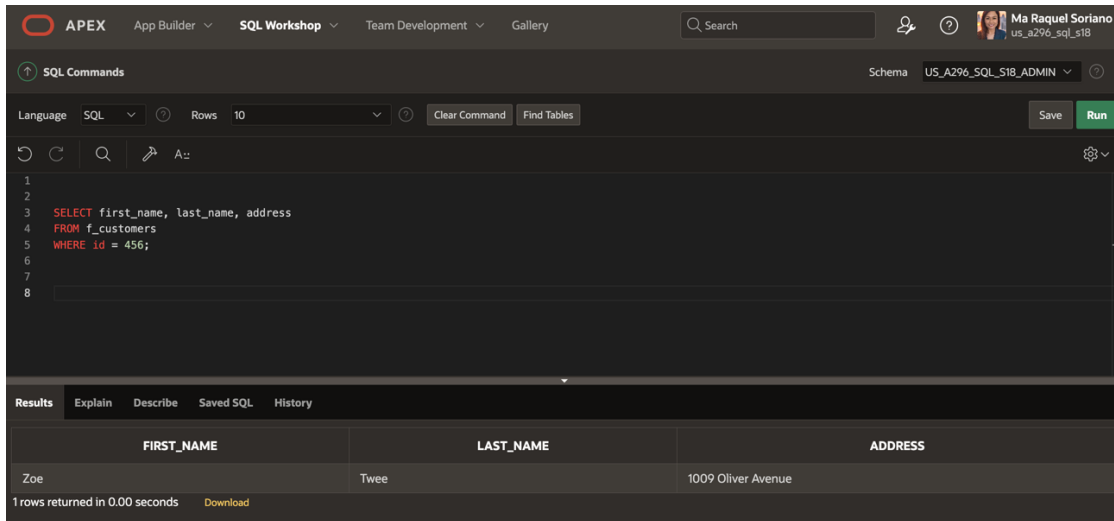
### Vocabulary

- 1) WHERE CLAUSE – Restricts the rows returned by a select statement
- 2) COMPARISON OPERATOR – Compares one expression to another value or expression



## Try It / Solve It

1) Using the Global Fast Foods database, retrieve the customer's first name, last name, and address for the customer who uses ID 456.



The screenshot shows the APEX SQL Workshop interface. The SQL command is:

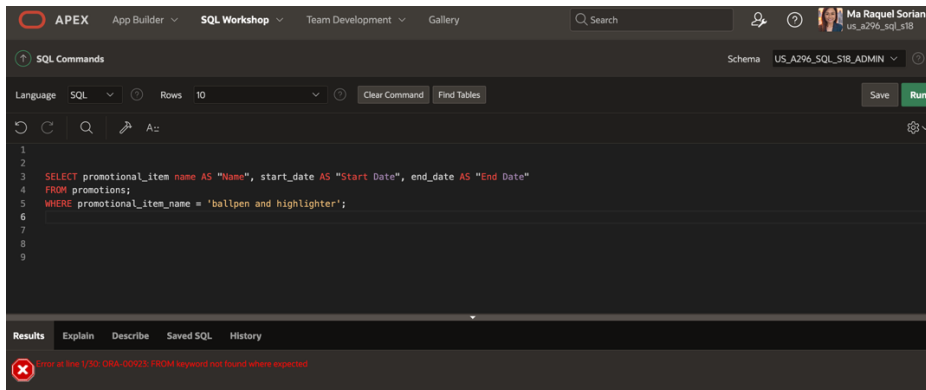
```
SELECT first_name, last_name, address
FROM f_customers
WHERE id = 456;
```

The results are displayed in a table:

FIRST_NAME	LAST_NAME	ADDRESS
Zoe	Twee	1009 Oliver Avenue

1 rows returned in 0.00 seconds

2) Show the name, start date, and end date for Global Fast Foods' promotional item "ballpen and highlighter" giveaway.



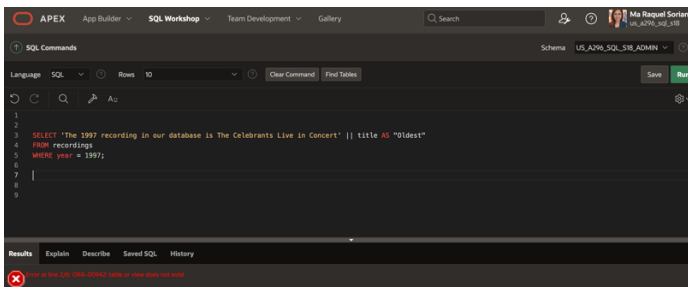
The screenshot shows the APEX SQL Workshop interface. The SQL command is:

```
SELECT promotional_item name AS "Name", start_date AS "Start Date", end_date AS "End Date"
FROM promotions;
WHERE promotional_item_name = 'ballpen and highlighter';
```

An error message is displayed: "ORA-00923: FROM keyword not found where expected".

3) Create a SQL statement that produces the following output:

Oldest
The 1997 recording in our database is The Celebrants Live in Concert



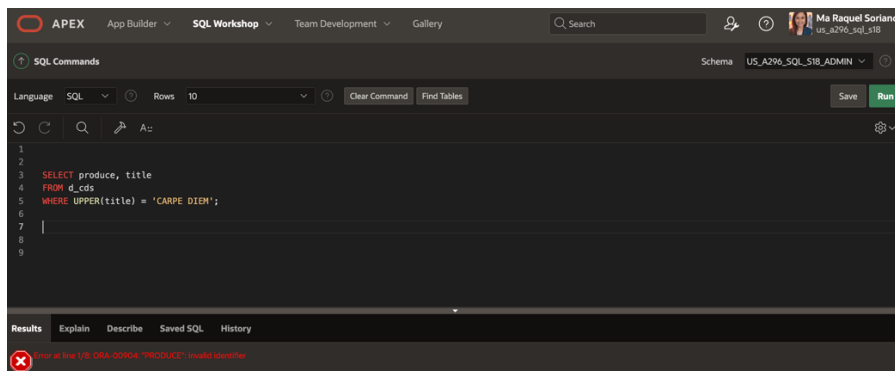
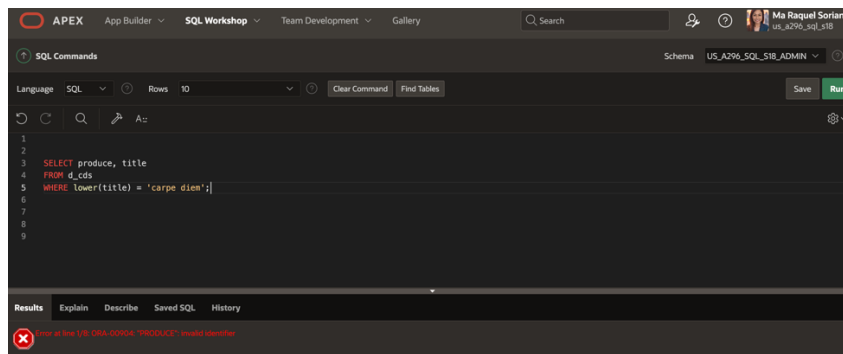
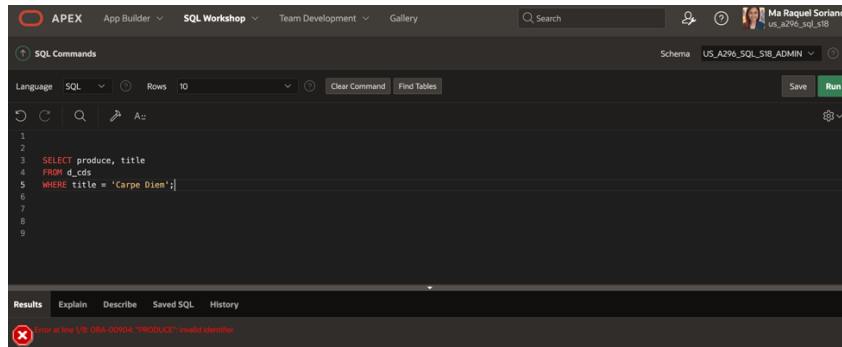
The screenshot shows the APEX SQL Workshop interface. The SQL command is:

```
SELECT 'The 1997 recording in our database is The Celebrants Live in Concert' || title AS "Oldest"
FROM recordings
WHERE year = 1997;
```

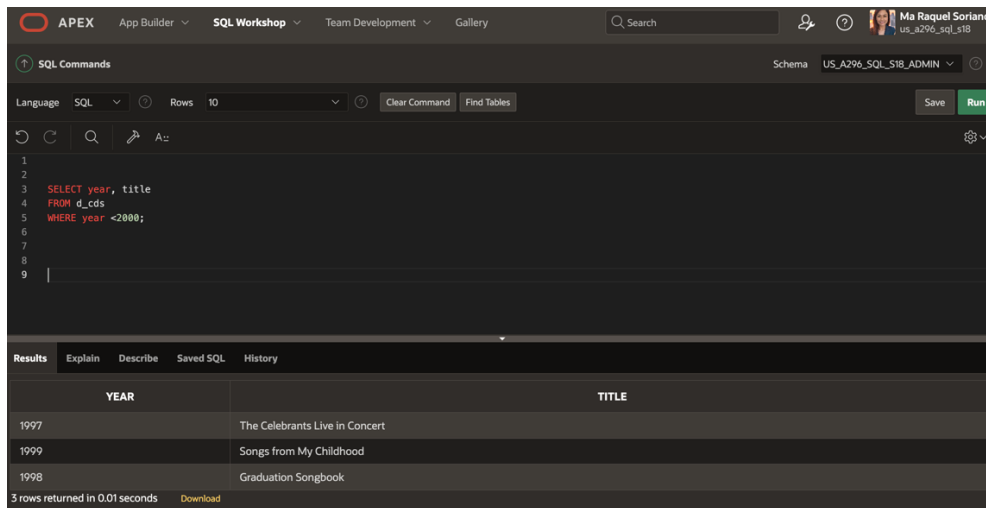
An error message is displayed: "ORA-00923: FROM keyword not found where expected".

4) The following query was supposed to return the CD title "Carpe Diem" but no rows were returned. Correct the mistake in the statement and show the output. — I couldn't find the correct answer. I tried the possible correct sql commands.

```
SELECT produce, title
FROM d_cds
WHERE title = 'carpe diem' ;
```



5) The manager of DJs on Demand would like a report of all the CD titles and years of CDs that were produced before 2000.



The screenshot shows the APEX SQL Workshop interface. The SQL Commands pane contains the following query:

```
1  
2  
3 SELECT year, title  
4 FROM d_cds  
5 WHERE year < 2000;  
6  
7  
8  
9
```

The Results pane shows the following data:

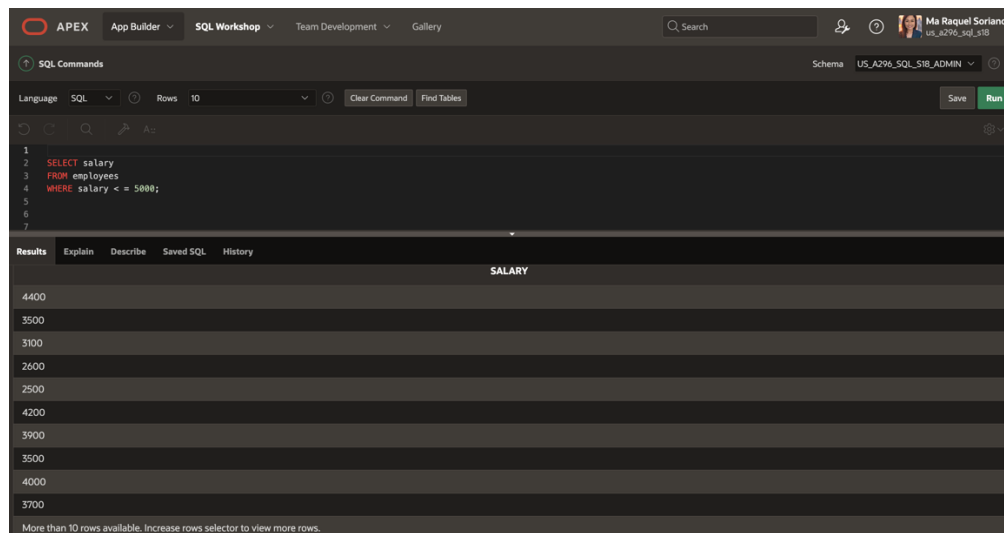
YEAR	TITLE
1997	The Celebrants Live in Concert
1999	Songs from My Childhood
1998	Graduation Songbook

3 rows returned in 0.01 seconds. Download

6) Which values will be selected in the following query?

```
SELECT salary  
FROM employees  
WHERE salary < = 5000;
```

- a. 5000
- b. 0 - 4999
- c. 2500
- d. 5



The screenshot shows the APEX SQL Workshop interface. The SQL Commands pane contains the following query:

```
1  
2 SELECT salary  
3 FROM employees  
4 WHERE salary < = 5000;  
5  
6  
7
```

The Results pane shows the following data:

SALARY
4400
3500
3100
2600
2500
4200
3900
3500
4000
3700

More than 10 rows available. Increase rows selector to view more rows.

For the next three questions, use the following table information:

TABLE NAME: students

COLUMNS:

studentno NUMBER(6)

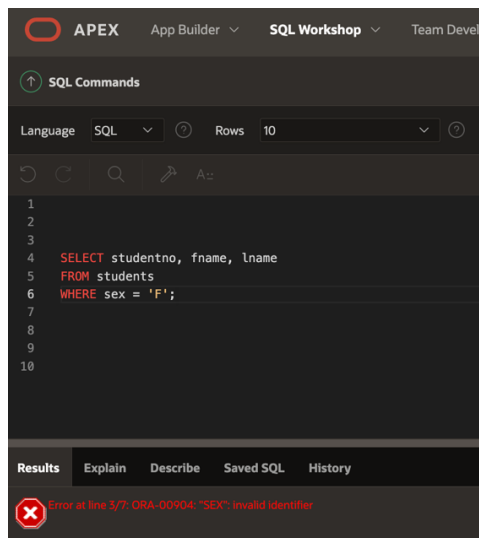
fname VARCHAR2(12)

lname VARCHAR(20)

sex CHAR(1)

major VARCHAR2(24)

7) Write a SQL statement that will display the student number (studentno), first name (fname), and last name (lname) for all students who are female (F) in the table named students.

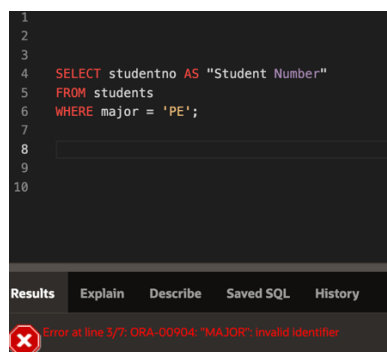


The screenshot shows the APEX SQL Workshop interface. The SQL command entered is:

```
1  
2  
3  
4 SELECT studentno, fname, lname  
5 FROM students  
6 WHERE sex = 'F';  
7  
8  
9  
10
```

The error message at the bottom states: "Error at line 5/7: ORA-00904: "SEX": invalid identifier".

8) Write a SQL statement that will display the student number (studentno) of any student who has a PE major in the table named students. Title the studentno column Student Number.



The screenshot shows the APEX SQL Workshop interface. The SQL command entered is:

```
1  
2  
3  
4 SELECT studentno AS "Student Number"  
5 FROM students  
6 WHERE major = 'PE';  
7  
8  
9  
10
```

The error message at the bottom states: "Error at line 5/7: ORA-00904: "MAJOR": invalid identifier".

9) Write a SQL statement that lists all information about all male students in the table named students.

```
3
4 SELECT *
5 FROM students
6 WHERE sex = 'M';
7
8
9
10
```

Results Explain Describe Saved SQL History

Error at line 3/7: ORA-00904: "SEX": invalid identifier

10) Write a SQL statement that will list the titles and years of all the DJs on Demand CDs that were not produced in 2000.

APEX App Builder SQL Workshop Team Development Gallery

SQL Commands Schema US\_A296\_SQL\_S18\_ADMIN

Language SQL Rows 10 Clear Command Find Tables Save Run

```
1
2
3
4 SELECT year, title
5 FROM d_cds
6 WHERE year <> 2000;
7
8
9
```

Results Explain Describe Saved SQL History

YEAR	TITLE
1997	The Celebrants Live in Concert
2002	Back to the Shire
1999	Songs from My Childhood
2001	Here Comes the Bride
1998	Graduation Songbook
2004	Whirled Peas

6 rows returned in 0.01 seconds Download

11) Write a SQL statement that lists the Global Fast Foods employees who were born before 1980.

```
2
3
4 SELECT *
5 FROM employees
6 WHERE birthdate < TO_DATE('1980-01-01', 'YYYY-MM-DD');
7
8
9
```

Results Explain Describe Saved SQL History

Error at line 3/7: ORA-00904: "BIRTHDATE": invalid identifier

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## SQL Database Programming: Section 2-3 Comparison Operators

### Vocabulary

- 1) ESCAPE – This option identifies that the escape characters should be interpreted literally
- 2) NULL – Condition tests for null values
- 3) BETWEEN – Displays rows based on a range of values
- 4) INCLUSIVE – Including the specified limits and the area between them; the numbers 1-10, inclusive
- 5) LIKE condition – Selects rows that match a character pattern
- 6) IN – Tests for values in a specified list of values

### Try It / Solve It

- 1) Display the first name, last name, and salary of all Global Fast Foods staff whose salary is between \$5.00 and \$10.00 per hour.

```
2
3
4 SELECT first_name, last_name, salary
5 FROM staff
6 WHERE salary BETWEEN 5.00 AND 10.00;
7
8
9
```

Results Explain Describe Saved SQL History

Error at line 2/6: ORA-00942: table or view does not exist

- 2) Display the location type and comments for all DJs on Demand venues that are Private Home.

```
3
4 SELECT location_type, comments
5 FROM D_venues
6 WHERE location_type = 'Private Home';
7
8
```

Results Explain Describe Saved SQL History

Error at line 3/7: ORA-00904: "LOCATION\_TYPE": invalid identifier

- 3) Using only the less than, equal, or greater than operators, rewrite the following query:

```
SELECT first_name, last_name
FROM f_staffs
WHERE salary BETWEEN 20.00 and 60.00;
```

The screenshot shows the APEX SQL Workshop interface. The SQL Commands tab is active, displaying a query that has been rewritten using greater than or equal to and less than or equal to operators. The query is as follows:

```
1
2
3
4 SELECT first_name, last_name
5 FROM f_staffs
6 WHERE salary >= 20.00 AND salary <= 60.00;
7
8
```

The Results tab is also visible, showing a table with two columns: FIRST\_NAME and LAST\_NAME. The data returned is:

FIRST_NAME	LAST_NAME
Monique	Tuttle

1 rows returned in 0.01 seconds

- 4) Create a list of all the DJs on Demand CD titles that have “a” as the second letter in the title.

Result: Error

- 5) Who are the partners of DJs on Demand who do not get an authorized expense amount?

Result: Error

- 6) Select all the Oracle database employees whose last names end with “s”. Change the heading of the column to read Possible Candidates.

The screenshot shows the APEX SQL Workshop interface. The SQL Commands tab is active, displaying a query that selects the last names of employees whose last names end with 's'. The query is as follows:

```
2
3
4 SELECT Last_name AS "Possible Candidates"
5 FROM Employees
6 WHERE Last_name LIKE '%s';
7
8
```

The Results tab is also visible, showing a table with one column: Possible Candidates. The data returned is:

Possible Candidates
Davies
Higgins
Loermans
Matos
Mourgos
Rajs
Stocks
Vargas

8 rows returned in 0.00 seconds

- 7) Which statement(s) are valid?
- a. WHERE quantity <> NULL;
  - b. WHERE quantity = NULL;
  - c. WHERE quantity IS NULL;
  - d. WHERE quantity != NULL;

- 8) Write a SQL statement that lists the songs in the DJs on Demand inventory that are type code 77, 12, or 1.  
Result: Error (in Oracle Apex)

```
SELECT Title
FROM Inventory
WHERE Type_Code IN (77, 12, 1);
```

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## SQL Database Programming: Section 3-1 Logical Comparisons and Precedence Rules

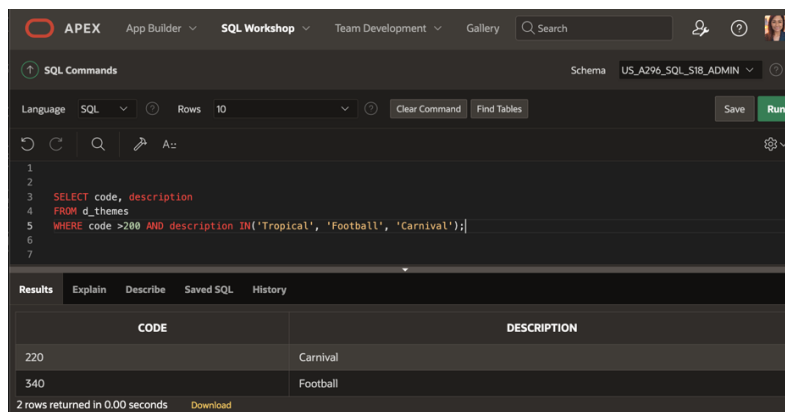
### Vocabulary

- 1) NOT – Inverts the value of the condition
- 2) AND – Both conditions must be true for a record to be selected
- 3) ORDER OF OPERATIONS – Rules that determine the order in which expressions are evaluated and calculated
- 4) OR – Either condition can be true for a record to be selected

### Try It / Solve It

- 1) Execute the two queries below. Why do these nearly identical statements produce two different results? Name the difference and explain why.

```
SELECT code, description
FROM d_themes
WHERE code >200 AND description IN('Tropical', 'Football', 'Carnival');
```



The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is: `SELECT code, description FROM d_themes WHERE code >200 AND description IN('Tropical', 'Football', 'Carnival');`. The results are displayed in a table with two columns: CODE and DESCRIPTION. The results are:

CODE	DESCRIPTION
220	Carnival
340	Football

2 rows returned in 0.00 seconds



- This query uses logical operator--**AND** which returns TRUE if both conditions specified in the WHERE clause are true.
- The results show rows that has a code that is >200 **AND** under the description of 'Tropical', 'Football', and 'Carnival.' In this case, only 'Carnival' and 'Football' are shown.

```
SELECT code, description
FROM d_themes
WHERE code >200 OR description IN('Tropical', 'Football', 'Carnival');
```

The screenshot shows the APEX SQL Workshop interface. The query editor contains the following SQL code:

```
1
2
3 SELECT code, description
4 FROM d_themes
5 WHERE code >200 OR description IN('Tropical', 'Football', 'Carnival');
```

The results tab shows a table with two columns: CODE and DESCRIPTION. The results are as follows:

CODE	DESCRIPTION
200	Tropical
220	Carnival
240	Sixties
454	Eighties
340	Football
502	Fairy Tale

6 rows returned in 0.01 seconds

- This query uses logical operator--**OR** which returns TRUE if either condition specified in the WHERE clause is true.
- The results show rows that has a code which is either >200 or with a description of 'Tropical', 'Football', 'Carnival', **OR** both of these. In this query, it populated multiple codes and description compared to the first query.

2) Display the last names of all Global Fast Foods employees who have “e” and “i” in their last names.

The screenshot shows the APEX SQL Workshop interface. The query editor contains the following SQL code:

```
1
2
3 SELECT Last_name
4 FROM Employees
5 WHERE Last_name LIKE '%e%' AND Last_name LIKE '%i%';
```

The results tab shows a table with one column: LAST\_NAME. The results are as follows:

LAST_NAME
Almeida Castro
Davies
Fontaine
Gietz
Hartstein
Heiden
Reinhard
Steiner

8 rows returned in 0.01 seconds

3) I need to know who the Global Fast Foods employees are that make more than \$6.50/hour and their position is not order taker. —RESULT: Error (in Oracle Apex)

4) Using the employees table, write a query to display all employees whose last names start with “D” and have “a” and “e” anywhere in their last name.

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. The user is logged in as 'Ma Raquel Soriano' with the schema 'US\_A296\_SQL\_S18\_ADMIN'. The 'SQL Commands' tab is active, showing a query:

```
1  
2  
3 SELECT *  
4 FROM Employees  
5 WHERE Last_name LIKE 'D%' AND Last_name LIKE '%a%' AND Last_name LIKE '%e%';
```

The 'Results' tab is selected, displaying a table with 12 columns: EMPLOYEE\_ID, FIRST\_NAME, LAST\_NAME, EMAIL, PHONE\_NUMBER, HIRE\_DATE, JOB\_ID, SALARY, COMMISSION\_PCT, MANAGER\_ID, DEPARTMENT\_ID, and BONUS. Two rows are shown:

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER	HIRE_DATE	JOB_ID	SALARY	COMMISSION_PCT	MANAGER_ID	DEPARTMENT_ID	BONUS
142	Curtis	Davies	CDAVIES	650.121.2994	29-Jan-2012	ST_CLERK	3100	-	124	50	-
102	Lex	De Haan	LDEHAAN	515.123.4569	13-Jan-2008	AD_VP	17000	-	100	90	-

At the bottom, it states '2 rows returned in 0.01 seconds' and provides a 'Download' link.

5) In which venues did DJs on Demand have events that were not in private homes? Result: Error in Oracle Apex

6) Which list of operators is in the correct order from highest precedence to lowest precedence?

- a. AND, NOT, OR
- b. NOT, OR, AND
- c. NOT, AND, OR

For questions 7 and 8, write SQL statements that will produce the desired output.

7) Who am I?

I was hired by Oracle after May 1998 but before June of 1999. My salary is less than \$8000 per month, and I have an “en” in my last name.

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar is the same as the previous screenshot. The user is logged in as 'Ma Raquel Soriano' with the schema 'US\_A296\_SQL\_S18\_ADMIN'. The 'SQL Commands' tab is active, showing a query:

```
1  
2  
3 SELECT *  
4 FROM Employees  
5 WHERE Hire_date > TO_DATE('1998-05-31', 'YYYY-MM-DD')  
6 AND Hire_date < TO_DATE('1999-06-01', 'YYYY-MM-DD')  
7 AND Salary < 8000  
8 AND Last_name LIKE '%en%';
```

The 'Results' tab is selected, displaying 'no data found'.

8) What's my email address?

Because I have been working for Oracle since the beginning of 1996, I make more than \$9000 per month. Because I make so much money, I don't get a commission.

```
1
2
3 SELECT Email
4 FROM Employees
5 WHERE Hire_date <TO_DATE('1996-01-01', 'YYYY-MM-DD')
6 AND Salary >9000
7 AND Commission IS NULL;
```

Results Explain Describe Saved SQL History

Error at line 5/5: ORA-00904: "COMMISSION": invalid identifier

```
1
2
3 SELECT *
4 FROM Employees
5 WHERE Hire_date <TO_DATE('1996-01-01', 'YYYY-MM-DD')
6 AND Salary >9000
7 AND Commission IS NULL;
```

Results Explain Describe Saved SQL History

Error at line 5/5: ORA-00904: "COMMISSION": invalid identifier

## SQL Database Programming: Section 3-2 Sorting Rows

### Vocabulary

- 1) ORDER BY CLAUSE – Orders the rows in ascending order (the default order); A-Z
- 2) SORTING – Orders the rows in descending order: Z-A
- 3) ORDER OF EXECUTION - To arrange according to class, kind, or size

### Try It/Solve It

1) In the example below, assign the employee\_id column the alias of “Number.” Complete the SQL statement to order the result set by the column alias.

```
SELECT employee_id, first_name, last_name
FROM employees;
```

APEX App Builder SQL Workshop Team Development Gallery Search

SQL Commands Schema US\_A296\_SQL\_S18\_ADMIN

Language SQL Rows 10 Clear Command Find Tables Save Run

```
1
2
3 SELECT employee_id AS "Number", first_name, last_name
4 FROM employees
5 ORDER BY "Number";
6
7
```

Results Explain Describe Saved SQL History

Number	FIRST_NAME	LAST_NAME
100	Steven	King
101	Neena	Kochhar
102	Lex	De Haan
103	Alexander	Hunold
104	Bruce	Ernst
107	Diana	Lorentz
124	Kevin	Mourgos
141	Trenna	Rajs
142	Curtis	Davies
143	Randall	Matos

- 2) Create a query that will return all the DJs on Demand CD titles ordered by year with titles in alphabetical order by year.  
Result: Error in Oracle Apex
- 3) Order the DJs on Demand songs by descending title. Use the alias “Our Collection” for the song title.  
Result: Error in Oracle Apex
- 4) Write a SQL statement using the ORDER BY clause that could retrieve the information needed. Do not run the query.  
Result: Error in Oracle Apex
- 5) Write a SQL statement using the employees table and the ORDER BY clause that could retrieve the information in the following table. Return only those employees with employee\_id < 125.

DEPARTMENT_ID	LAST_NAME	MANAGER_ID
90	Kochhar	100
90	King	(null)
90	De Haan	100
60	Lorentz	103
60	Hunold	102
60	Ernst	103
50	Mourgos	100

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```

1
2
3 SELECT Department_ID, Last_Name, Manager_Id
4 FROM Employees
5 WHERE Employee_ID <125
6 ORDER BY Department_ID DESC, Manager_ID;
7
8

```

The results are displayed in a table with the following data:

DEPARTMENT_ID	LAST_NAME	MANAGER_ID
90	Kochhar	100
90	De Haan	100
90	King	-
60	Hunold	102
60	Ernst	103
60	Lorentz	103
50	Mourgos	100

7 rows returned in 0.00 seconds

## Extension Activities

- 1) Limiting values with the WHERE clause is an example of:
  - a. Projection
  - b. Ordering
  - c. Joining
  - d. Grouping
  - e. Selection
- 2) You want to sort your CD collection by title, and then by artist. This can be accomplished using:
  - a. WHERE
  - b. SELECT
  - c. ORDER BY
  - d. DISTINCT

3) Which of the following are SQL keywords?

- a. SELECT
- b. ALIAS
- c. COLUMN
- d. FROM

4) Which of the following are true?

- a. Multiplication and division take priority over addition.
- b. Operators of the same priority are evaluated from left to right.
- c. Parentheses can be used to override the rules of precedence.
- d. None of the above are true.

5) The following query was written:

```
SELECT DISTINCT last_name  
FROM students
```

- a. To select all the outstanding students
- b. To choose last names that are duplicates
- c. To select last names without duplicates
- d. To select all last names

6) The following string was created using which SELECT clause?

Abby Rogers is an order taker for Global Fast Foods

- a. SELECT first\_name || ' ' || last\_name || ' is an ' staff\_type ' for Global Fast Foods'
- b. SELECT Abby Rogers is an || staff\_type || ' for Global Fast Foods'
- c. SELECT first\_name,last\_name ' || staff\_type || ' for Global Fast Foods'
- d. SELECT first\_name || ' ' || last\_name || ' is an ' || staff\_type || ' for Global Fast Foods'

7) Which of the following SELECT clauses will return uppercase column headings?

- a. SELECT id, last\_name, address, city, state, zip, phone\_number;
- b. SELECT ID, LAST\_NAME, ADDRESS, CITY, STATE, ZIP, PHONE\_NUMBER;
- c. SELECT Id, Last\_name, Address, City, State, Zip, Phone\_number;
- d. SELECT id AS ID, last\_name AS NAME, address AS ADDRESS, city AS CITY, state AS STATE, zip AS ZIP, phone\_number AS PHONE\_NUMBER;

8) Which SELECT statement will **always** return the last names in alphabetical order?

- a. SELECT last\_name AS ORDER BY FROM employees
- b. SELECT last\_name FROM employees ORDER BY last\_name
- c. SELECT last\_name FROM employees
- d. SELECT ASC last\_name FROM employees

9) Which SELECT clause will return a column heading for employee\_id called "New Employees"?

- a. SELECT last\_name AS "New Employees"
- b. SELECT employee\_id AS New Employees
- c. SELECT employee AS "New Employees"
- d. SELECT employee\_id AS "New Employees"

10) Examine the following query:

```
SELECT last_name, job_id, salary  
FROM employees
```

WHERE job\_id = 'SA\_REP' OR job\_id = 'AD\_PRES' AND salary > 15000;

Which results could not have been returned from this query?

a. Joe Everyone, sales representative, salary 15000

b. Jane Hendricks, sales manager, salary 15500 → due to the fact that the position of Jane Hendricks is 'sales manager'

c. Arnie Smithers, administration president, 20000

d. Jordan Lim, sales representative, salary 14000

11) Finish this query so it returns all employees whose last names start with "St".

SELECT last\_name

FROM employees

→ SELECT last\_name

FROM employees

WHERE last\_name LIKE 'St%' [St: the last name that should start with and %: to show results that has 'St']

12) What salary values will not be returned from this query?

SELECT last\_name, first\_name, salary

FROM employees

WHERE salary BETWEEN 1900 AND 2100;

→ Salaries before 1900s and after 2100s. It will only show values that is within the 1900 and 2100 period.

13) Correct each WHERE clause:

a. WHERE department\_id NOT IN 101,102,103; → WHERE department\_id NOT IN (101,102,103);

b. WHERE last\_name = King → WHERE last\_name = 'King';

c. WHERE start date LIKE "05-May-1998" → WHERE start\_date LIKE '05-May-1998'

d. WHERE salary IS BETWEEN 5000 AND 7000 → WHERE salary BETWEEN 5000 AND 7000;

e. WHERE id =! 10 → WHERE id != or <> 10;