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Assignment: SQL: Database Foundations Sections 2, 3: Select, Where, Order by, Functions
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1.1
What I Learned

- Computers were around for a long time, but didn't get used for business and personal computing until application software programs were made
- **Application programs:** allow people to buy fully developed, ready-to-use programs
- Application vs System Software
    - **System software:** has low-level programs meant to interact with hardware
        - E.g. operating system, compilers, system utilities
    - **Application software:** allows users to perform specific tasks like creating documents, browsing the internet, using a database, emailing, or playing games

1.2
What I Learned

- **Relational database management system (RDBMS)**: categorizes data into rows and columns. Data can be accessed with structured query language (SQL) statements and operators.
- Databases are a major part of our everyday life. It's used in airports, traffic lights, and big companies like Amazon
- Properties of a relational database
    - Entries in columns are single-valued and are of the same kind (data type)
    - Each row is unique
    - Sequence of columns and rows are both insignificant
    - Each column has a unique name
- Key Term Review
    - **Foreign key:** a column that refers to a primary key in another table
    - **Primary key:** unique identifier for each row
    - **Field:** one value found between the intersection of a row and column

1.3
Vocabulary - Identify the vocabulary word for each definition below

Word	Definition
JOIN	Display data from two or more related tables.
operators	A symbol used to perform an operation on some values.

columns	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.
arithmetic expressions	A mathematical equation.
selection	The capability in SQL to choose the rows in a table returned from a query.
SELECT	Retrieves information from the database
SELECT clause	Specifies the columns to be displayed
FROM clause	Specifies the table containing the column listed in the select clause
keyword	An individual SQL command
clause	Part of a SQL statement
statement	A combination of the two clauses

1. Write a SQL statement that demonstrates projection

ANSWER: underlined is the projection
SELECT id, name, publisher
FROM books;

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.”

ANSWER:
SELECT last_name “Client”, email “Email Address”
FROM d_client

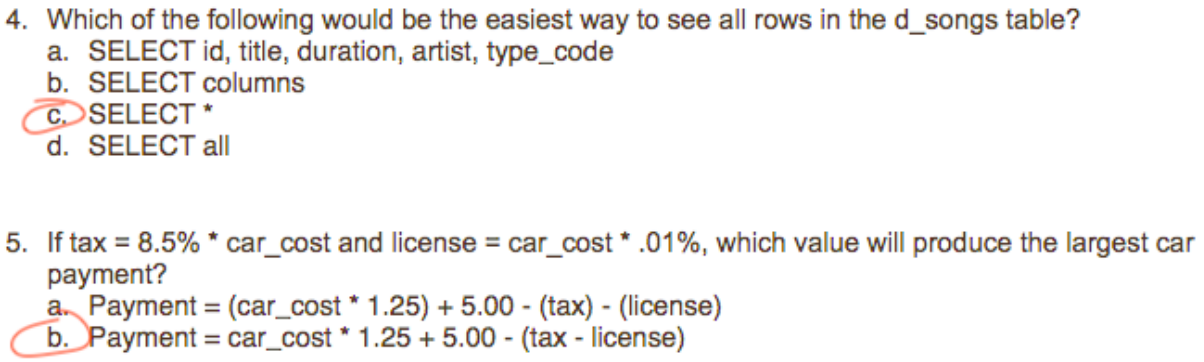
3. The manager of Global Fast Foods decided to give all employees at 5%/hour raise + a $.50 bonus/hour. However, when he looked at the results, he couldn't figure out why the

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;

ANSWER:
SELECT last_name, salary * 1.05 +.50
FROM f_staffs;

4. Q&A in image below
5. Q&A in image below


4. Which of the following would be the easiest way to see all rows in the d_songs table?
   a. SELECT id, title, duration, artist, type_code
   b. SELECT columns
   c. SELECT *
   d. SELECT all

5. If tax = 8.5% * car_cost and license = car_cost * .01%, which value will produce the largest car payment?
   a. Payment = (car_cost * 1.25) + 5.00 - (tax) - (license)
   b. Payment = car_cost * 1.25 + 5.00 - (tax - license)

6. In the example below, identify the keywords, the clause(s), and the statement(s):

SELECT employee_id, last_name
FROM employees

ANSWER:

- **Keywords**
  - SELECT
  - FROM
- **Clause**
  - SELECT employee_id, last_name
  - FROM employees
- **Statement:**
  - SELECT employee_id, last_name FROM employees

7. Label each example as SELECTION or PROJECTION.
   a. Please give me Mary Adam's email address.

i. SELECTION

b. I would like only the manager_id column, and none of the other columns.

i. PROJECTION

8. Q&A in image below
9. Q&A in image below
10. Q&A in image below

8. Which of the following statements are true?
   a. null * 25 = 0;
   b. null * 6.00 = 6.00
   c. null * .05 = null
   d. (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;

   a. bears, color, age
   b. BEARS, COLOR, AGE
   c. BEARS, COLOR, age
   d. Bears, Color, Age

10. Which of the following words must be in a SELECT statement in order to return all rows?
    a. SELECT only
    b. SELECT and FROM
    c. FROM only
    d. SELECT * only

2.1

Vocabulary - Identify the vocabulary word for each definition below

Word	Definition
DISTINCT	A command that suppresses duplicates
Concatenation Operator → ||	Links two columns together to form one character data column
Literal values	A group of character data
DESCRIBE or DESC	An SQL plus command that displays the structure of a table

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.

ANSWER:
SELECT last_name, mailing_address

2. Each statement below has errors. 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 DISCTINCT f_order_lines FROM quantity;
    d. SELECT order number FROM f_orders;

ANSWER:

a. SELECT first_name FROM f_staffs;

FIRST_NAME
Sue
Bob
Monique

b. SELECT first_name || ' ' || last_name AS "DJs on Demand Clients" FROM d_clients;

DJs on Demand Clients
Hiram Peters
Serena Jones
Lauren Vigil

c. SELECT DISTINCT quantity FROM f_order_lines;

QUANTITY
2

d. SELECT order_number FROM f_orders;

ORDER_NUMBER
5678

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 ***

ANSWER:

```
SELECT '*** ' || first_name || ' *** ' || first_name || ' ***' "Super Star"
FROM f_staffs;
```

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

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 Lizzie 10-Nov-1987 will be returned.
    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

ANSWER:

```
SELECT last_name "EMPLOYEE LAST NAME", salary "CURRENT SALARY",
ROUND(salary*1.05, 2) "SALARY WITH 5% RAISE"
FROM f_staffs;
```

EMPLOYEE LAST NAME	CURRENT SALARY	SALARY WITH 5% RAISE
Doe	6.75	7.09
Miller	10	10.5
Tuttle	60	63

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

ANSWER:

- DESC EMPLOYEES
- The columns marked “nullable” are the ones with check marks as shown in the image. It means that the field can be left empty. It does not require the user to put a value in there when creating a record.

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	-	✓	-	-
	COMMISSION_PCT	NUMBER	-	2	2	-	✓	-	-
	MANAGER_ID	NUMBER	-	6	0	-	✓	-	-
	DEPARTMENT_ID	NUMBER	-	4	0	-	✓	-	-
	BONUS	VARCHAR2	5	-	-	-	✓	-	-

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

ANSWER:

```
SELECT cd_number "Inventory Item", title "CD Title", producer "Music Producer", year "Year Purchased"
FROM d_cds;
```

Inventory Item	CD Title	Music Producer	Year Purchased
90	The Celebrants Live in Concert	Old Town Records	1997
91	Party Music for All Occasions	The Music Man	2000
92	Back to the Shire	Middle Earth Records	2002
93	Songs from My Childhood	Old Town Records	1999
94	Carpe Diem	R & B Inc.	2000
95	Here Comes the Bride	The Music Man	2001
96	Graduation Songbook	Tunes Are Us	1998
98	Whirled Peas	Old Town Records	2004

8. True/False -- The following SELECT statement executes successfully:

```
SELECT last_name, job_id, salary
AS Sal FROM employees;
```

9. True/False -- The following SELECT statement executes successfully:

```
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;
```

ANSWER:

- No comma after last_name
- ANNUAL SALARY is not double quoted nor has an underscore between the words
- “sal” is not the actual column name, but “salary.”
- The multiplication operator is incorrect. It should be an asterisk rather than x

11. In the arithmetic expression salary*12 - 400, which operation will be evaluated first?
    a. salary*12

12. NOTE: Questions 12 to 19 are in the image below

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.

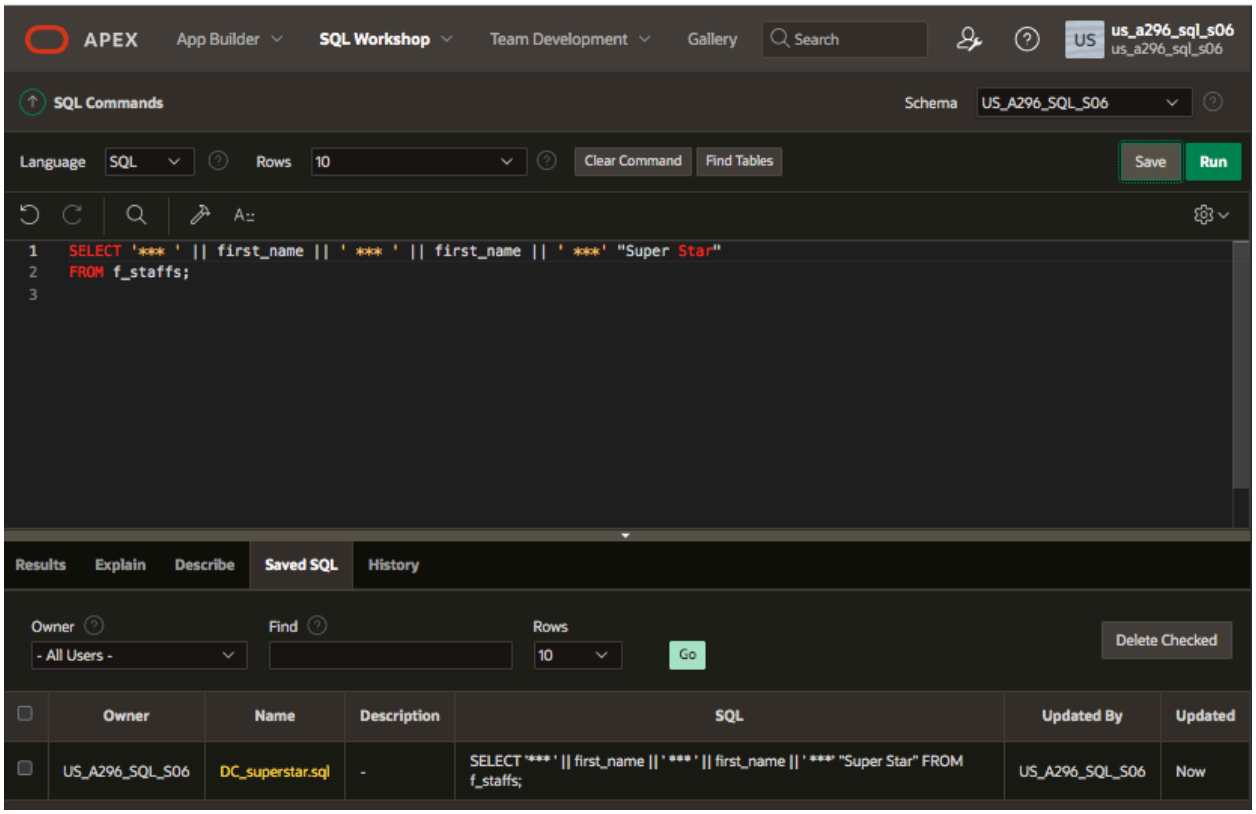
18. Which queries will return three columns each with UPPERCASE column headings?
    a. SELECT "Department_id", "Last_name", "First_name"
       FROM employees;
    b. SELECT DEPARTMENT_ID, LAST_NAME, FIRST_NAME
       FROM employees;
    c. SELECT department_id, last_name, first_name AS UPPER CASE
       FROM employees
    d. SELECT department_id, last_name, first_name
       FROM employees;

19. Which statement below will likely fail?
    a. SELCT * FROM employees;
    b. Select * FROM employees;
    c. SELECT * FROM EMPLOYEES;
    d. SelecT* FROM employees;

20. Click on the History link at the bottom of the SQL Commands window. Scroll or use the arrows at the bottom of the page to find the statement you wrote to solve problem 3 above. (The one with the column heading SuperStar). Click on the statement to load it back into the command window. Execute the command again, just to make sure it is the correct one that works. Once you know it works, click on the SAVE button in the top right corner of the SQL Commands window, and enter a name for your saved statement. Use your own initials and "_superstar.sql", so if your initials are CT then the filename will be CT_superstar.sql.

Log out of OAE, and log in again immediately. Navigate back to the SQL Commands window, click the Saved SQL link at the bottom of the page and load your saved SQL statement into the Edit window. This is done by clicking on the script name. Edit the statement, to make it display + instead of *. Run your amended statement and save it as initials_superplus.sql.

ANSWER:



2.2
Vocab

Word	Definition
WHERE	Restricts the rows returned by a select statement
Comparison operator	Compares one expression to another value or expression

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

ANSWER:
SELECT first_name, last_name, address
FROM f_customers

FIRST_NAME	LAST_NAME	ADDRESS
Cole	Bee	123 Main Street
Zoe	Twee	1009 Oliver Avenue

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

ANSWER:

```
SELECT name, start_date, end_date
FROM f_promotional_menus
WHERE give_away = 'ballpen and highlighter';
```

NAME	START_DATE	END_DATE
Back to School	01-Sep-2004	30-Sep-2004

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

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

ANSWER:

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

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

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.

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

ANSWER:

```
SELECT producer, title
FROM d_cds
WHERE title = 'Carpe Diem' ;
```

PRODUCER	TITLE
R & B Inc.	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

ANSWER:
SELECT title, year
FROM d_cds
WHERE year < 2000;

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

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

SELECT salary
FROM employees
WHERE salary <= 5000;

NOTE: The query was run in APEX and 2500 was the only value in the output that met the condition.

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

For the next three questions (7 - 9), 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

ANSWER:

```
SELECT studentno, fname, lname
FROM students
WHERE sex = 'F';
```

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.

ANSWER:

```
SELECT studentno "Student Number"
FROM students
WHERE major = 'PE';
```

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

ANSWER:

```
SELECT *
FROM students
WHERE sex = 'M';
```

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.

ANSWER:

```
SELECT title, year
FROM d_cds
WHERE year != 2000;
```

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

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

ANSWER:

```
SELECT first_name || ' ' || last_name "Global Fast Foods Employees", birthdate
FROM f_staffs
WHERE birthdate < '01-Jan-1980';
```

Global Fast Foods Employees	BIRTHDATE
Bob Miller	19-Mar-1979
Monique Tuttle	30-Mar-1969

2.3
Vocab

Word	Definition
ESCAPE	This option identifies that the escape characters should be interpreted literally
IS NULL	Condition tests for null values
BETWEEN…AND…	Displays rows based on a range of values
WHERE…BETWEEN…AND…	Including the specified limits and the area between them; the numbers 1-10, inclusive
LIKE	Selects rows that match a character pattern
IN	Tests for values in a specified list of values

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.

ANSWER:

```
SELECT first_name, last_name, salary
FROM f_staffs
WHERE salary BETWEEN 5 AND 10;
```

FIRST_NAME	LAST_NAME	SALARY
Sue	Doe	6.75
Bob	Miller	10

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

ANSWER:
SELECT loc_type, comments
FROM d_venues
WHERE loc_type = 'Private Home';

LOC_TYPE	COMMENTS
Private Home	Large kitchen, spacious lawn
Private Home	3 level townhouse, speakers on all floors
Private Home	Gazebo, multi-level deck

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;

ANSWER:
SELECT first_name, last_name
FROM f_staffs
WHERE salary >= 20.00 AND salary <= 60.00;

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

ANSWER:
SELECT title
FROM d_cds
WHERE title LIKE '_a%';

TITLE
Back to the Shire
Carpe Diem
Party Music for All Occasions

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

ANSWER:
SELECT first_name || ' ' || last_name "Partners w/ no authorized expense amount",
auth_expense_amt
FROM d_partners

WHERE auth_expense_amt IS NULL;

Partners w/ no authorized expense amount	AUTH_EXPENSE_AMT
Jennifer cho	-
Jason Tsang	-

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

ANSWER:
SELECT first_name || ' ' || last_name "Possible Candidates"
FROM employees
WHERE last_name LIKE '%s';

Possible Candidates
Curtis Davies
Shelley Higgins
Jennifer Loermans
Randall Matos
Kevin Mourgos
Trenna Rajs
Michael Stocks
Peter Vargas

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

ANSWER:
SELECT title
FROM d_songs
WHERE type_code IN (1, 12, 77);

TITLE	TYPE_CODE
Its Finally Over	12
Im Going to Miss My Teacher	12
Hurrah for Today	77
Meet Me At the Altar	1
Lets Celebrate	77

3.1
Vocab

Word	Definition
NOT	Inverts the value of the condition
AND	Both conditions must be true for a record to be selected
Precedence Rules	Rules that determine the order in which expressions are
OR	Either condition can be true for a record to be selected

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');

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

ANSWER:
The first statement uses the AND operator while the second uses the OR operator. For the first statement, both conditions must be met to return true. For the second statement, only one of the conditions needs to be met.

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

ANSWER:
SELECT last_name
FROM f_staffs
WHERE last_name LIKE '%e%' AND last_name LIKE '%i%';

LAST_NAME
Miller

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.

ANSWER:
SELECT first_name || ' ' || last_name employees, staff_type, salary
FROM f_staffs
WHERE salary > 6.25 AND staff_type != 'Order Taker';

EMPLOYEES	STAFF_TYPE	SALARY
Bob Miller	Cook	10
Monique Tuttle	Manager	60

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

ANSWER:
SELECT first_name || ' ' || last_name employees
FROM employees
WHERE last_name LIKE 'D%'
AND last_name LIKE '%a%'
AND last_name LIKE '%e%';

EMPLOYEES
Curtis Davies
Lex De Haan

5. In which venues did DJs on Demand have events that were not in private homes?

ANSWER:
SELECT loc_type, address
FROM d_venues
WHERE loc_type != 'Private Home';

LOC_TYPE	ADDRESS
School Hall	4 Mahogany Drive, Boston, MA 10010
National Park	87 Park Avenue, San Diego, CA 28978
Hotel	200 Pennsylvania Ave, Washington D.C. 09002

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.

ANSWER:

```
SELECT *
FROM employees
WHERE hire_date BETWEEN '01-Jun-1998' AND '31-May-1999'
AND salary < 8000
AND last_name LIKE '%en%';
```

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.

ANSWER:

```
SELECT *
FROM employees
WHERE hire_date > '01-Jan-1996' AND salary > 9000 AND commission_pct IS NULL;
```

3.2

Vocab

Word	Definition
Ascending - ASC	Orders the rows in ascending order (the default order); A-Z

Descending - DESC	Orders the rows in descending order: Z-A
ORDER BY	To arrange according to class, kind, or size

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;
```

ANSWER:

```
SELECT employee_id “Number”, first_name, last_name
FROM employees
ORDER BY “Number”;
```

2. Create a query that will return all the DJs on Demand CD titles ordered by year with titles in alphabetical order by year.

ANSWER:

```
SELECT title
FROM d_cds
ORDER BY year, title;
```

3. Order the DJs on Demand songs by descending title. Use the alias “Our Collection” for the song title

ANSWER:

```
SELECT title "Our Collection"
FROM d_cds
ORDER BY title DESC;
```

4. Write a SQL statement using the ORDER BY clause that could retrieve the information needed. Do not run the query.

   Create a list of students who are in their first year of school. Include the first name, last name, student ID number, and parking place number. Sort the results alphabetically by student last name and then by first name. If more than one student has the same last name, sort each first name in Z to A order. All other results should be in alphabetical order (A to Z).

ANSWER:

```
SELECT first_name, last_name, student_id, parking_number
FROM students
WHERE year = 'Freshman'
ORDER BY last_name, first_name DESC;
```

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

ANSWER:

```
SELECT department_id, last_name, manager_id
FROM employees
WHERE employee_id < 125
ORDER BY department_id DESC, last_name DESC;
```

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

Extension Activities (Q1-10 are in the images below, Q11 to 14 are not)

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"

- NOTE for Q10, the answer could technically be "None" as the results show the full name of the job rather than SA_REP or AD_PRES. My chosen answer treats the results in the choices as if they meant to use the abbreviated versions of the job titles.

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
    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

ANSWER:
SELECT last_name
FROM employees
WHERE last_name LIKE '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;

ANSWER:

- Anything below 1900 and above 2100 will not be returned from that query. 1900 and 2100 are inclusive in BETWEEN…AND….

13. Correct each WHERE clause:

a. WHERE department_id NOT IN 101,102,103;
b. WHERE last_name = King
c. WHERE start date LIKE "05-May-1998"
d. WHERE salary IS BETWEEN 5000 AND 7000
e. e. WHERE id =! 10

ANSWER:

a. WHERE department_id NOT IN (101,102,103);
b. WHERE last_name = 'King'
c. WHERE start date = "05-May-1998"
d. WHERE salary BETWEEN 5000 AND 7000
e. WHERE id != 10

14. SELECT prefix
FROM phone
WHERE prefix BETWEEN 360 AND 425
OR prefix IN (206,253,625)
AND prefix BETWEEN 315 AND 620;

Which of the following values could be returned?

a. 625
b. 902
c. 410
d. 499

3.3

1. For each task, choose whether a single-row or multiple row function would be most appropriate:
    a. Showing all of the email addresses in upper case letters
        i. Single-row function
    b. Determining the average salary for the employees in the sales department
        i. Multiple row function
    c. Showing hire dates with the month spelled out (September 1, 2004)
        i. Single-row function
    d. Finding out the employees in each department that had the most seniority (the earliest hire date)
        i. Multiple row function
    e. Displaying the employees' salaries rounded to the hundreds place
        i. Single-row function
    f. Substituting zeros for null values when displaying employee commissions
        i. Single-row function
2. The most common multiple-row functions are: AVG, COUNT, MAX, MIN, and SUM. Give your own definition for each of these functions.
    a. AVG → gets the average of a group of rows
    b. COUNT → gets the total number of your selected rows
    c. MAX → gets the highest value in a group of rows
    d. MIN → gets the lowest value in a group of rows
    e. SUM → gets the combined total of a group of rows
3. Test your definitions by substituting each of the multiple-row functions into this query.

    SELECT FUNCTION(salary)
    FROM employees

    Write out each query and its results.

ANSWERS:

a) SELECT AVG(salary)
FROM employees

AVG(SALARY)
7355

b) SELECT COUNT(salary)
FROM employees

COUNT(SALARY)
40

c) SELECT MAX(salary)
FROM employees

MAX(SALARY)
24000

d) SELECT MIN(salary)
FROM employees

MIN(SALARY)
2500

e) SELECT SUM(salary)
FROM employees

SUM(SALARY)
294200

1 rows returned in 0.00 seconds Download