

Database Programming with SQL

19-3: Final Exam Review

Practice Activities

Objectives

- Review the key points about case and character manipulation
- Review number, date, conversion, and general functions
- Review conditional expressions
- Review Cartesian product and join operations
- Review non-equijoins, outer joins, self joins, cross joins, natural joins, and join clauses
- Review group functions, group by syntax, and having clauses
- Review single-row and multiple row subqueries
- Review pair-wise and non-pair-wise subqueries
- Review correlated subqueries
- Review DML statements insert, update, delete, merge, and multi-table inserts
- Review DDL statements CREATE, ALTER, RENAME, TRUNCATE, FLASHBACK TABLE, DROP, and FLASHBACK QUERY
- Review DCL statements CREATE and REVOKE object privileges

Try It / Solve It

1. The business manager of Global Fast Foods needs to update the customer list. She wants to find any zip/postal code that has fewer than 10 digits in order to identify those codes without the new format postfix 87392-8723. Create a query to identify those customers.
2. In the following list of functions, mark with N those that can be used with numbers, mark with C those that can operate on character data, and mark with D those that can be used with dates.
 - a. LPAD
 - b. ROUND
 - c. TRUNC
 - d. LENGTH
 - e. LAST_DAY
 - f. INSTR
 - g. CONCAT
3. You need to display the auth_expense_amt for each DJs on Demand partner. For those partners who do not have an expense account, the output should display "Not Approved."

4. Jason and Jamie tried to run a report displaying the Global Fast Foods staff members who do not have an overtime rate. They wrote the following SQL query and received a report error: ORA-01722: invalid number.

```
SELECT first_name, last_name, NVL(overtime_rate, 'no overtime') As "Payrate"
FROM f_staffs;
```

What is wrong with their query and how can it be fixed?

5. The president of Global Fast Foods likes to send a birthday card to all employees. He has asked you to send a reminder to him on the month of the employee's birthday so the card can be sent with that month's paycheck. Prepare a query to produce the table shown.

FIRST_NAME	LAST_NAME	BIRTHDATE	SEND CARD
Sue	Doe	01-Jul-1980	July 2005
Bob	Miller	19-Mar-1979	March 2005
Monique	Tuttle	30-Mar-1969	March 2005

6. For each statement, mark T if the statement is true or F if the statement is false.
- TO_CHAR is required to convert the date '03-Jun-2004' to June 3, 2004.
 - TO_NUMBER will convert '23-Nov-2002' to use with ADD_MONTHS.
 - TO_DATE will convert SYSDATE to today's date.
 - TO_NUMBER('101', '\$99999') will convert 101 to a number.
 - TO_CHAR(salary, '\$9999.99') will convert number to character format.
 - TO_NUM(varchar2 column) will convert character data to a number.
 - TO_CHAR(SYSDATE, 'Month fmdd, yyyy') will format the date.
7. Employees in the Oracle database who have worked more than 10 years will be given one extra week of vacation. Create a report showing first name, last name, and years worked. Round the result to one decimal place.
8. The manager of DJs on Demand needs you to change the zip code for ID 105, New York venues. She wants to show the old zip code in one column and the new zip code in another column. The new zip code is the same as the old zip code except -2345 needs to be added to the end. The output should appear as shown in the table.

OLD ZIP	NEW ZIP
11220	11220-2345

9. Create a query using one SELECT statement that returns today's date. Assign an alias to each column.
 - a. Rounded to the nearest year
 - b. Rounded to the nearest month
 - c. Truncated to the nearest year
 - d. Truncated to the nearest month
10. You need to find out how many days it has been since the start of the Global Fast Foods promotional menus. Round the result to the nearest day.
11. The Human Resources department (Oracle database) has decided that, for their purposes, the job title for all employees will be the first five letters of the job title followed by an asterisk. For example, the accounting manager will be changed to accou*. Create a query to accomplish this request.
12. What is the order of operations in question 11?
13. Write a query to return all the rows and columns from the employees table, but make the department_id a substitution variables, and then execute your query with two or three different department_id's to test it.

Part 2

1. Use the Oracle database employees table. Write and execute one query for each term.
LOWER
UPPER
INITCAP
CONCAT
SUBSTR
LENGTH
INSTR
LPAD
RPAD
TRIM
REPLACE
ROUND
TRUNC
MOD
MONTHS_BETWEEN
ADD_MONTHS
NEXT_DAY
LAST_DAY
SYSDATE
2. Create two different queries that produce the cd number and title as “94CARPE DIEM.”
Use the d_cds table in the DJs on Demand database.
3. Mark the following statements as True or False.
____ a. LOWER converts numbers to lowercase.
____ b. Use RPAD to move numbers to the right to place an * on the left.
____ c. TRIM can be used to trim one or more characters from a string.
____ d. LENGTH returns a number.
____ e. SUBSTR is used to substitute one string for another.
____ f. CONCAT is limited to using two parameters.
____ g. TRUNC will return zero decimal places if a decimal value is omitted.
4. Create a query to show the cost of events for DJs on Demand in the format \$0000.00
5. For the f_staffs table in the Global Fast Foods database, change the ID of those staff members whose IDs are only single digits to two digits by adding an asterisk * to the front of the number. For example, change ID 9 to ID *9.

6. As the database administrator, you have been asked to store historical employee records in the current database. The records have termination dates from 1990 to 1999. Write a query using DUAL to show how you could store 15-Dec-1995.
7. Using DUAL, format 19-Jun-2004 to appear as: 19th of June two thousand four
8. Create a query that will return only the last word from "Oracle Academy."
9. Lance and Arnie created the following SQL query but it did not return any results. What is the problem with this query?

```
SELECT loc_type
FROM d_venues
WHERE loc_type LIKE 'National Park'
AND ID = 200;
```

10. What type of function would you use in each case?

D = Date function

N = Number function

C = Conversion/Character functions

G = General function

CE = Conditional expression

- _____ a. To convert varchar2 to number data
- _____ b. To format a date to other than the default format
- _____ c. To convert a date such as June 19, 2000 to default format
- _____ d. To format a number to appear as currency
- _____ e. To substitute a value in a table for null
- _____ f. To do an IF-THEN-ELSE statement
- _____ g. To find the first not null expression among a list of expressions
- _____ h. To replace a section of a string with another string
- _____ i. To format a 20th-century date
- _____ j. To present output all in uppercase
- _____ k. To find the numeric position of a character in a string
- _____ l. To find the last day of the month

Part 3

1. A/An _____ is when the rows of the tables are combined with each other and produce new rows. The number of rows is equivalent to the product of the number of rows in each table.
2. A/An _____ is used when you need to query a table that has a relationship to itself.
3. A/An _____ preserves unmatched rows from one or both tables, returning the rows that are matched and unmatched from one or both tables.
4. In an outer join, a plus sign (+) is placed on the side of the join that is _____ information.
5. A _____ is used when a column in one table does not correspond directly to a column in another table.
6. The join condition is always placed in the _____ clause of the SELECT statement.
7. A/An _____ is used to preface the column name in order to clarify which table and column are participating in the join.
8. Table aliases are created in the _____ clause of the SELECT statement.
9. In a full outer join, a row that does not contain data will/will not appear in the result set if the row satisfies the join condition.
10. Table aliases cannot exceed _____ characters in length.
11. Identify the Oracle syntax to signify an outer join _____.
12. If a join condition is written: WHERE e.client_number = c.client_number, what kind of join would it be if we wanted all the information in the e table even if the c table has missing data? _____

13. Joins that are based on hierarchical relationships such as manager and employee are called _____.
14. How many join conditions does it take to join three tables? ____
15. What does the term “proprietary syntax” mean?
16. What type of join condition is best when two columns with the same name but different datatypes exist in two different tables?
17. What type of join(s) is based on all columns in two tables that have the same name?
18. Another name for a cross-join is a_____.
19. When specifying a join, you need to identify the what, where, and how. Match up these terms to the SQL syntax words: FROM, WHERE, SELECT.
20. For each join condition listed, mark T for those that can include an alias in the syntax:
- ____ cross-join
 - ____ equijoin
 - ____ nonequijoin
 - ____ natural join
 - ____ full outer join
 - ____ left outer join
 - ____ USING clause
21. Which two types of join conditions cannot use an alias?

22. The query below is an example of what kind of join?

```
SELECT last_name, first_name
FROM f_staffs, f_orders;
```

LAST_NAME	SID	MID
Abernathy	349	Null
Avery	342	Null
Barnaby	1420	349
Chang	555	349
Dixon	554	349
Evans	873	342
Franco	1933	342
Gallaway	943	349

STUDENTS

COURSES	CID
Oracle_Internet_Academy_DM	101
Oracle_Internet_Academy_Java	102
Oracle_Internet_Academy_Java	103

COURSES

SID	CID
1420	101
555	101
554	101
873	102
342	103
349	103
943	103
1933	103

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23. Use the three tables shown above to answer the following questions:

- a. What kind of join would you use to join all three tables? _____ Write the syntax that would produce the desired result.
- b. Name two tables that could be used to retrieve data from a natural join. Write the syntax that would produce the desired result.
- c. What kind of join would you use to return only those students who have mentors? Write the syntax that would produce the desired result.
- d. What kind of join would you use to return all students whether they have a mentor or not. Write the syntax that would produce the desired result.

24. Write a hierarchical query to display the organization chart of the employees table. Ensure the query starts with the employee who has no manager. Make the query return the employee's first and last names along with the last name of his manager.

25. Write a query that displays the department_id, job_id, and the total salary for each job_id within a department. Make the query return subtotals of salary per department_id and a grand total of all salaries across the company. Use the EMPLOYEES table for this query.

26. Write a query that will combine the following columns: employee first and last_name, department_id, job_id, and salary from the employees table, the employee_id, start_date, end_date, and job_id from job_history and the department_name and location_id from the departments table. The queries should return one single output.

Part 4

1. Create copies of the following Oracle database tables and name them as specified:
 - employees copied as o_employees
 - departments copied as o_departments
 - jobs copied as o_jobs
2. As the DBA for Oracle, you have been asked to update the database with new information.

Last month, O created a new department in Seattle called Human Resources. The department was assigned ID 210. Employees in this department have the job title Human Resources Manager, and job ID HR_MAN. The salary for all new employees in this department ranges from a minimum of \$4500 to a maximum of \$5500.

Add the Human Resources job to the o_jobs table.

EMPLOYEE_ID	FIRST_NAME	LAST_NAME
210	Ramon	Sanchez
211	Tai	Sugita
212	Alina	Arcos

3. Three new employees hired for this department are shown in the table. Add them to the o_employees table.

Each employee will need an email address created from the first letter of the employee's first name combined with the employee's last name (Bob Smith would be BSMITH). Use the current date as the hire date.

4. Add Human Resources to the o_departments table.
5. Several changes need to be made to the o_employees, o_departments, and o_jobs tables.
 - Ramon Sanchez has a new phone number:
360-509-7132.
 - The location for the Seattle Human Resources department is 1700.
 - Ramon Sanchez, Tai Sugita, and Alina Arcos need their department ID updated to 210 if it has not been done as yet.
 - Ramon's salary is \$5000; Tai earns \$5100.
 - Delete Alina Arcos, who has decided to return to college to finish her sociology degree.

Part 5

1. What purpose do constraints serve in a database?
2. Why would you choose to create a CHECK constraint? Give an example.
3. How can you find out what constraints have been added to a column?
4. When can a constraint be defined for a table?
5. What's the advantage of naming your own constraints?
6. Why is referential integrity a concern for the DBA?
7. Why would you choose to define a constraint at the column level rather than in one place at the table level?
8. Why would a UNIQUE constraint be created?
9. Can more than one column be not null when a UNIQUE constraint is used? Why or why not?
10. Give an example of a composite unique key.
11. Only ___ primary key(s) can be created for each table.
12. What does a primary key enforce?
13. What is another name for a FOREIGN KEY constraint?
14. What does ON DELETE CASCADE accomplish?

15. What is the function of CASCADE in the ALTER CONSTRAINT syntax?
16. Create a copy of the employees table and call it your_initials_emp. Add a column to the new table called department_name, and make this column the same datatype and length as the department_name column in the departments table. Write a correlated update statement to update all the department_name columns in your new table to be the same as the department_name column values in the departments table itself.
17. Drop the o_employees table. Investigate where it went. Try to select from the dropped table. Now try to select from the dropped table using its bin-name. Restore the table.

Part 6

1. Which of the statements listed below are true about the following sequence? The sequence was used to generate numbers for the DJs on Demand D_CDS table cd_numbers column.

```
CREATE SEQUENCE cd_numbers_sq
INCREMENT BY 15
START WITH 105
MAXVALUE 999
NOMINVALUE
CYCLE
NOCACHE
```

- ☐ a. The value 165 will not be generated by this sequence.
☐ b. The value 999 will not be generated by this sequence.
☐ c. This sequence would be appropriate for PRIMARY KEY values.
☐ d. If the D_CDS table is deleted, the sequence is also deleted.
☐ e. If the system fails, sequence values will be lost.
☐ f. USER_OBJECTS documents this sequence in the data dictionary.
☐ g. The START WITH value could be changed with an ALTER SEQUENCE.
2. In the CREATE TABLE statement shown below, circle the letter of the line(s) that will automatically create an index.
- CREATE TABLE employees(
 - employee_id NUMBER(6),
 - last_name VARCHAR2(25) NOT NULL,
 - email VARCHAR2(25) CONSTRAINT emp_email_uk UNIQUE,
 - salary NUMBER(8,2),
 - commission_pct NUMBER(2,2),
 - hire_date DATE NOT NULL,
 - CONSTRAINT employee_id_pk PRIMARY KEY(employee_id),
 - CONSTRAINT emp_dept_fk FOREIGN KEY(department_id)REFERENCES
 - departments(department_id)

3. What data dictionary view contains the sequences created by a schema?
 - a. SEQUENCE_VIEW
 - b. USER_SEQUENCES
 - c. SEQUENCE_NAMES
 - d. USER_VIEWS

4. What is the proper syntax for changing the emp_email_index on the email column of the employees table?
 - a. CREATE INDEX emp_email_index ON employees (email);
 - b. ALTER INDEX emp_mail_index FROM employees(email);
 - c. CREATE AND REPLACE INDEX emp_email_index ON employees, COLUMN = email;
 - d. ADD INDEX emp_email_index INTO employees (email);
 - e. None of the above

5. Which data dictionary view is used to view the table name, the index name, and the column name that the index is based on?
 - a. USER_TABLE_INDEXES
 - b. USER_COLUMNS
 - c. USER_IND_COLUMNS
 - d. ALL_INDEXES

6. If the PUBLIC option is not included in the CREATE SYNONYM syntax, which of the following is true?
 - a. Users cannot lengthen object names.
 - b. The DBA does not have access to the synonym.
 - c. The synonym is not accessible to all users.
 - d. All object names must be qualified with PUBLIC.

7. What are the last three numbers created by the sequence?

```
CREATE SEQUENCE sample_seq  
INCREMENT BY 3  
START WITH 6  
MAXVALUE 14  
NOMINVALUE  
CYCLE  
NOCACHE
```

- a. 3, 6, 9
- b. 6, 9, 12
- c. 9, 12, 15
- d. 9, 12, 14

8. Which of the following is a good reason to create an index?
- a. A column has a large number of null values.
 - b. A column has a narrow range of values.
 - c. Most queries are expected to return more than 5% of the rows.
 - d. A table is updated frequently.
9. Which of the following constraints can be created at the table level?
- a. NOT NULL
 - b. FOREIGN KEY
 - c. PRIMARY KEY
 - d. UNIQUE COMPOSITE KEY
10. Which of the following cannot contain a single-row function?
- a. SELECT
 - b. FROM
 - c. WHERE
 - d. ORDER BY