2.1 Working with Columns, Characters, and Rows Practice Activities

Vocabulary: Identify the vocabulary word for each definition below.

DISTINCT	A command that suppresses duplicates
Concatenation Operator	Links two columns together to form one character data column
Character String	A group of character data
DESCRIBE	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.

- SELECT last_name, mailing_address
  FROM customers;

2. Each statement below has errors. Correct the errors and execute the query in Oracle Application Express.
   a. SELECT first name FROM f_staffs;

- SELECT first_name
  FROM f_staffs;

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

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

   c. SELECT DISCTINCT f_order_lines FROM quantity;

- SELECT DISTINCT f_order_lines
  FROM quantity;

   d. SELECT order number FROM f_orders;

- 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 ***

- SELECT '*** ' || first_name || ' ***' AS "Super Star"
  FROM f_staffs
  WHERE first_name IN ('Sue', 'Bob', '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.

- 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
SELECT last_name, salary	AS "CURRENT SALARY", salary * 1.05	AS "SALARY WITH 5% RAISE" FROM f_staffs;

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

- DESCRIBE EMPLOYEES;
- FIRST_NAME
- PHONE_NUMBER
- SALARY
- COMISSION_PCT
- MANAGER_ID
- DEPARTMENT_ID
- BONUS
- Nullable means that those columns can have missing values.

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.

- SELECT inventory_item, cd_title, music_producer, year_purchased
  FROM D_CDs;

8. True/False -- The following SELECT statement executes successfully:
   SELECT last_name, job_id, salary AS Sal
   FROM employees;

- TRUE

9. True/False -- The following SELECT statement executes successfully:
   SELECT *
   FROM job_grades;

- TRUE

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;

- SELECT employee_id, last_name, salary * 12 AS "ANNUAL SALARY"
  FROM employees;

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

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

- B. *

13. Using SQL to choose the columns in a table uses which capability?
    a. Selection
    b. Projection
    c. Partitioning
    d. join

- B. PROJECTION

14. SELECT last_name AS "Employee". The column heading in the query result will appear as:
    a. EMPLOYEE
    b. employee
    c. Employee
    d. "Employee:

- C. 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

- B. 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

- C. SELECT 'Mr./Ms. '||first_name||' '||last_name ||' '||'is an employee of our company.' AS "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.

- C. Keywords cannot be abbreviated or split across lines.

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;

- B. SELECT DEPARTMENT_ID, LAST_NAME, FIRST_NAME

FROM employees;

19. Which statement below will likely fail?

a. SELCT * FROM employees;

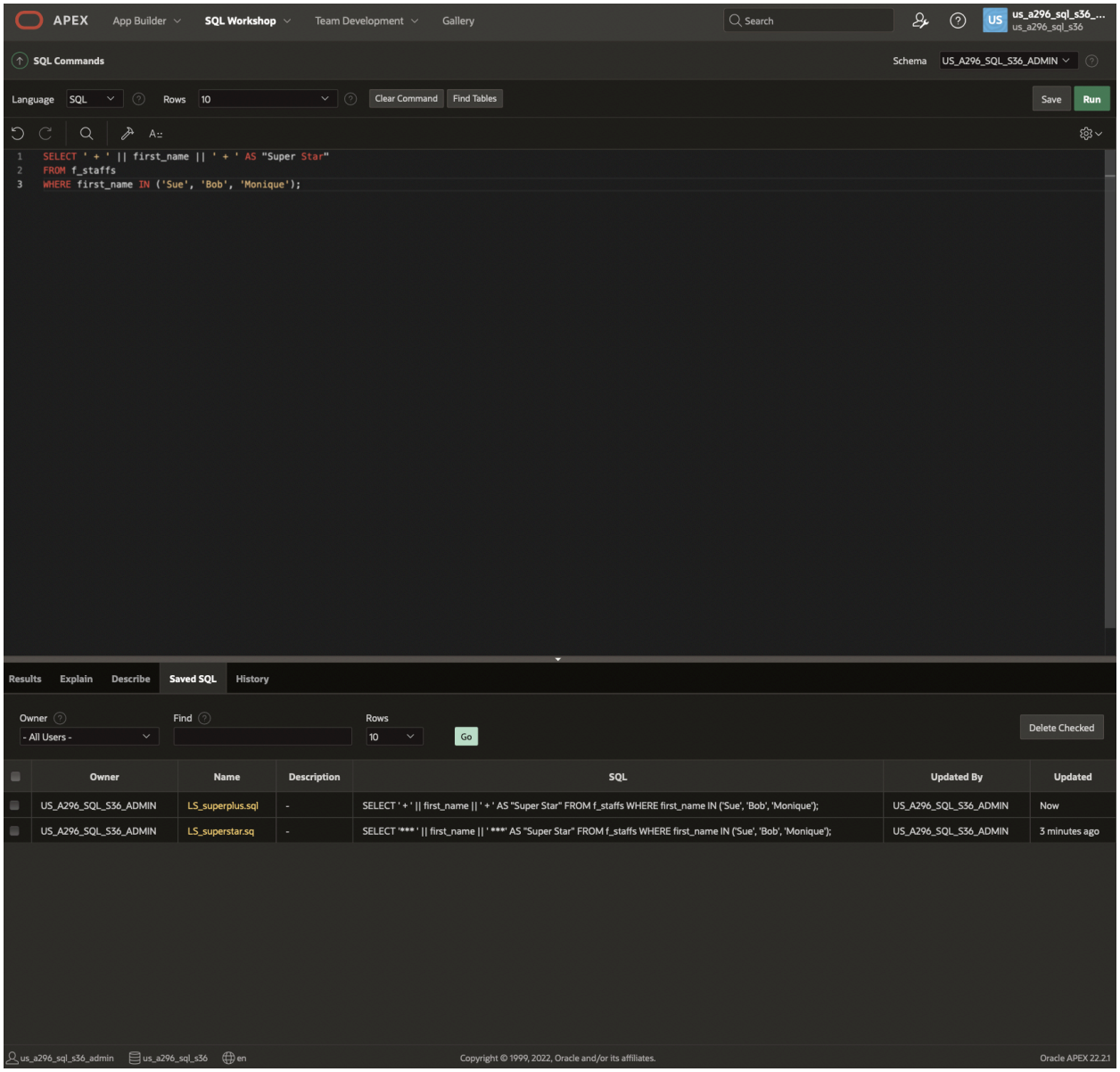
b. Select * FROM employees;

c. SELECT * FROM EMPLOYEES;

d. SelecT* FROM employees;

- A. SELCT * 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.



2.2 Limit Rows Selected Practice Activities

Vocabulary

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.

- Zoe Twee, 1009 Oliver Avenue.

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

- 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

- SELECT 'The 1997 recording in our database is ' || title AS Oldest
  FROM D_CDS
  WHERE year = 1997;

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' ;

- SELECT producer, title
  FROM D_CDS
  WHERE LOWER(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.

- SELECT title, year
  FROM D_CDS
  WHERE year < 2000;

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

- B. 0 - 4999

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.

- 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.

- SELECT studentno AS "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.

- 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.

- SELECT title, year
  FROM d_cds
  WHERE year <> 2000;

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

- SELECT *
  FROM employees

WHERE birth_date < '1980-01-01';

2.3 Comparison Operators Practice Activities

VOCABULARY

ESCAPE	This option identifies that the escape characters should be interpreted literally
IS NULL	Condition tests for null values
BETWEEN	Displays rows based on a range of values
BETWEEN	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.
- Sue Doe, $6.75
- Bob Miller, $10

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

- ```
  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.

- 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?

- Disk Jockey

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

Possible Candidates
Davies
Higgins
Loermans
Matos
Mourgos
Rajs
Stocks
Vargas

7. Which statement(s) are valid?

a. WHERE quantity <> NULL;

b. WHERE quantity = NULL;

c. WHERE quantity IS NULL;

d. WHERE quantity != NULL;

- C. WHERE quantity IS NULL;

8. Write a SQL statement that lists the songs in the DJs on Demand inventory that are type code 77, 12, or 1.

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

3-1: Logical Comparisons and Precedence Rules Practice Activities

VOCABULARY

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 evaluated and calculated
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');
```

- The first query uses AND so it only produces 2 codes because when using AND it needs to meet both conditions. As per why when executing the second query it produces 6 codes because the code states OR so it could be either condition.

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

- 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.

- SELECT *
  FROM f_staffs
  WHERE salary > 6.50 AND staff_type <> 'Order Taker';

(Bob Miller, Monique Tuttle)

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.

- SELECT *
  FROM employees
  WHERE last_name LIKE 'D%' AND last_name LIKE '%a%' AND last_name LIKE '%e%';

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

- SELECT *
  FROM d_venues
  WHERE loc_type <> 'Private Home';

ID	LOC_TYPE	ADDRESS	RENTAL_FEE	COMMENTS
95	School Hall	4 Mahogany Drive, Boston, MA 10010	75/hour	School closes at 10pm
99	National Park	87 Park Avenue, San Diego, CA 28978	400/flat fee	Bring generators
220	Hotel	200 Pennsylvania Ave, Washington D.C. 09002	300/per person	Classy affair, tight security, private entrance for vendors

3 rows returned in 0.01 seconds Download

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

- 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.

- SELECT *
  FROM employees
  WHERE hire_date > '01-May-1998' AND hire_date < '01-Jun-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.

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

3-2: Sorting Rows Practice Activities

VOCABULARY

ASC	Orders the rows in ascending order (the default order); A-Z
DESC	Orders the rows in descending order: Z-A
SORT	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;

- SELECT employee_id AS "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.

- 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.

- SELECT title AS "Our Collection"
  FROM d_songs
  ORDER BY "Our Collection" 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).

- SELECT first_name, last_name, stu_id, parking_place_number
  FROM students
  WHERE year = 1
  ORDER BY last_name ASC, 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

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

Extension Activities

1. Limiting values with the WHERE clause is an example of:

a. Projection

b. Ordering

c. Joining

d. Grouping

e. Selection

- 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

- C. ORDER BY

3. Which of the following are SQL keywords?

a. SELECT

b. ALIAS

c. COLUMN

d. FROM

- A. SELECT, 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.

- A. B. C.

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

- C.

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'

- D.

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;

- B.

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

- B.

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"

- D.

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

- A.

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%';

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 LESS THAN 1900 OR GREATER THAN 2100

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. WHERE id =! 10

- WHERE department_id NOT IN (101, 102, 103);
- WHERE last_name = 'King';
- WHERE start_date LIKE '05-May-1998';
- WHERE salary BETWEEN 5000 AND 7000;
- 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?
625, 902, 410, 499

- 625, 410

3-3: Introduction to Functions Practice Activities

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
   - SINGLE-ROW

b. Determining the average salary for the employees in the sales department
   - MULTIPLE-ROW

c. Showing hire dates with the month spelled out (September 1, 2004)
   - SINGLE-ROW

d. Finding out the employees in each department that had the most seniority (the earliest hire date)
   - MULTIPLE-ROW

e. Displaying the employees' salaries rounded to the hundreds place
   - SINGLE-ROW

f. Substituting zeros for null values when displaying employee commissions.
   - SINGLE-ROW

2. The most common multiple-row functions are: AVG, COUNT, MAX, MIN, and SUM. Give your own definition for each of these functions.

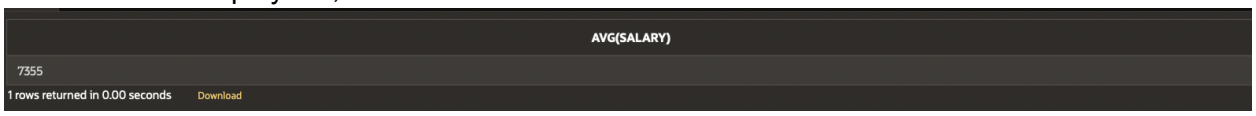
- AVG: Gives you the average of each column.
- COUNT: Counts the number of rows that match any condition or gives the number of columns that don't have any condition to them.
- MAX: Gives you the maximum value of a set of values.
- MIN: Gives you the minimum value of a set of values.
- SUM: Gives you the sum of all values in a numeric column.

3. Test your definitions by substituting each of the multiple-row functions into this query.

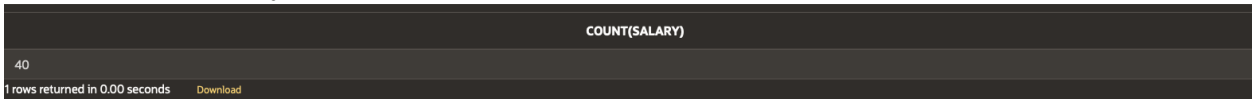
SELECT FUNCTION(salary)
FROM employees

Write out each query and its results.

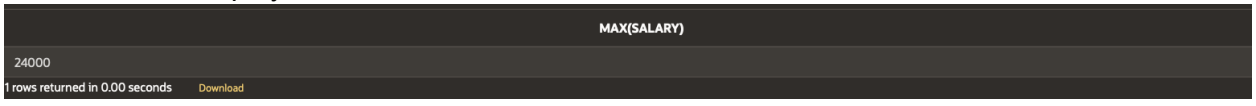
- SELECT AVG(salary)
  FROM employees;



- SELECT COUNT(salary)
  FROM employees;

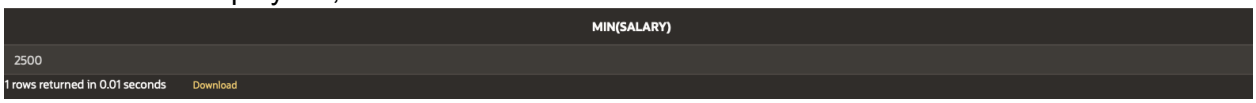


- SELECT MAX(salary)
  FROM employees;



- SELECT MIN(salary)

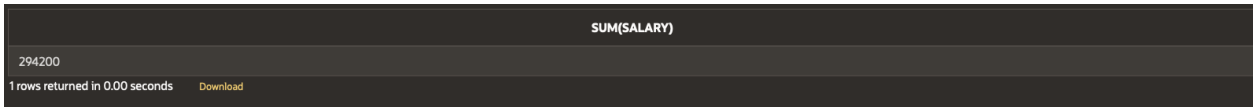
FROM employees;



MIN(SALARY)
2500

1 rows returned in 0.01 seconds Download

- SELECT SUM(salary)
  FROM employees;



SUM(SALARY)
294200

1 rows returned in 0.00 seconds Download