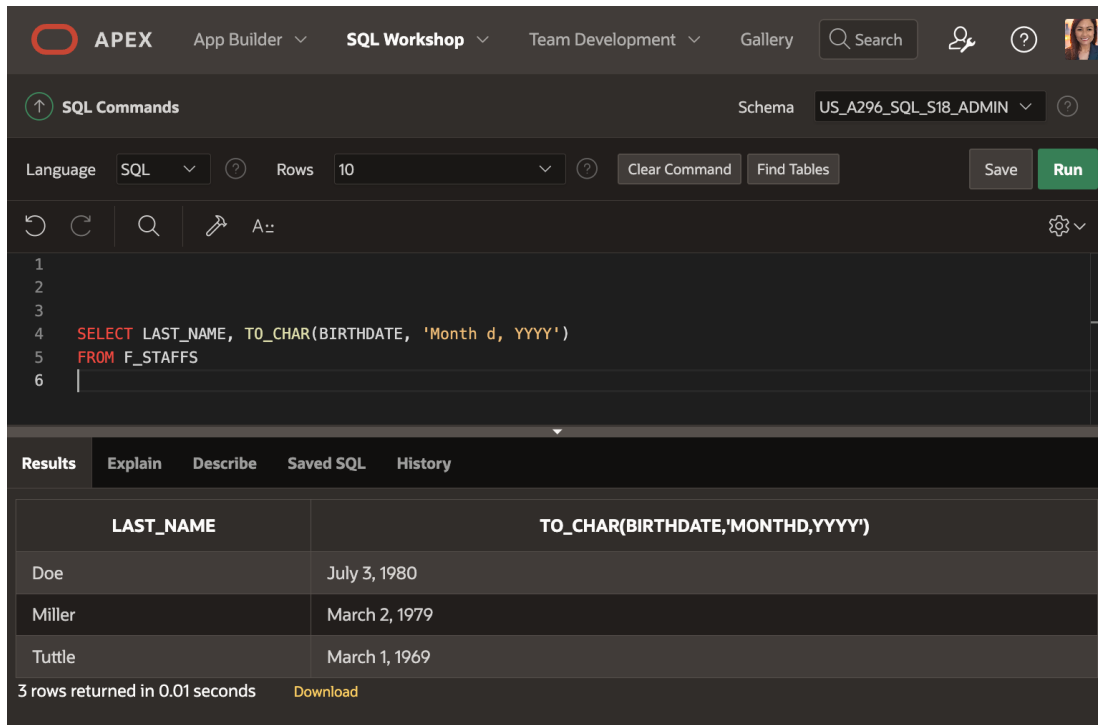

SQL Database Programming: Section 5-1: Conversion Functions

Vocabulary

CHAR	Used for text and character data of fixed length, including numbers, dashes, and special characters.
fm element	Used to remove padded blanks or to suppress leading zeros.
Conversion	Functions that convert a value from one data type to another.
NUMBER	Used to store variable-length numeric data.
VARCHAR2	Used for character data of variable length, including numbers, special characters, and dashes.
DATE	Used for date and time values.
TO_CHAR	Converts dates or numbers to character strings with optional formatting.
RR/YY date format	Century value depends on the specified year and the last two digits of the current year
TO_NUMBER	Converts a character string containing digits to a number with optional formatting
DD	Numeric day of the month
TO_DATE	Converts a character string representing a date to a date value with optional formatting

Try It / Solve It

1) List the last names and birthdays of Global Fast Food Employees. Convert the birth dates to character data in the Month DD, YYYY format. **Suppress any leading zeros.**



The screenshot shows the APEX SQL Workshop interface. The SQL Commands tab is active, displaying the following query:

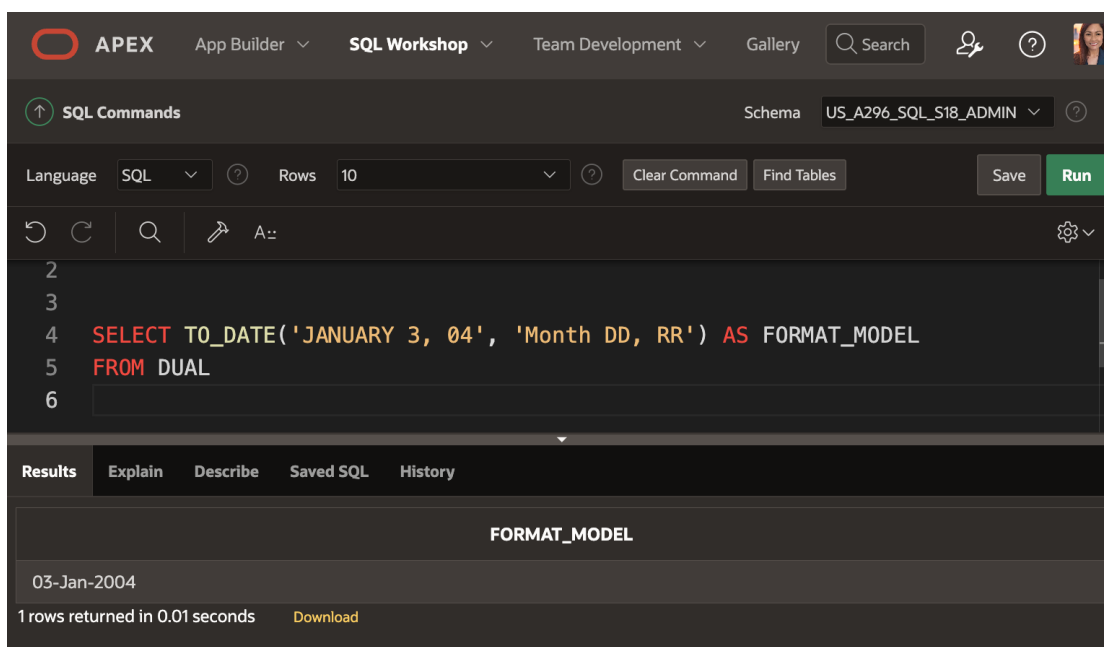
```
1  
2  
3  
4 SELECT LAST_NAME, TO_CHAR(BIRTHDATE, 'Month d, YYYY')  
5 FROM F_STAFFS  
6
```

The Results tab is selected, showing the output of the query:

LAST_NAME	TO_CHAR(BIRTHDATE,'MONTHD,YYYY')
Doe	July 3, 1980
Miller	March 2, 1979
Tuttle	March 1, 1969

3 rows returned in 0.01 seconds [Download](#)

2) Convert January 3, 04, to the default **date format 03-Jan-2004.**



The screenshot shows the APEX SQL Workshop interface. The SQL Commands tab is active, displaying the following query:

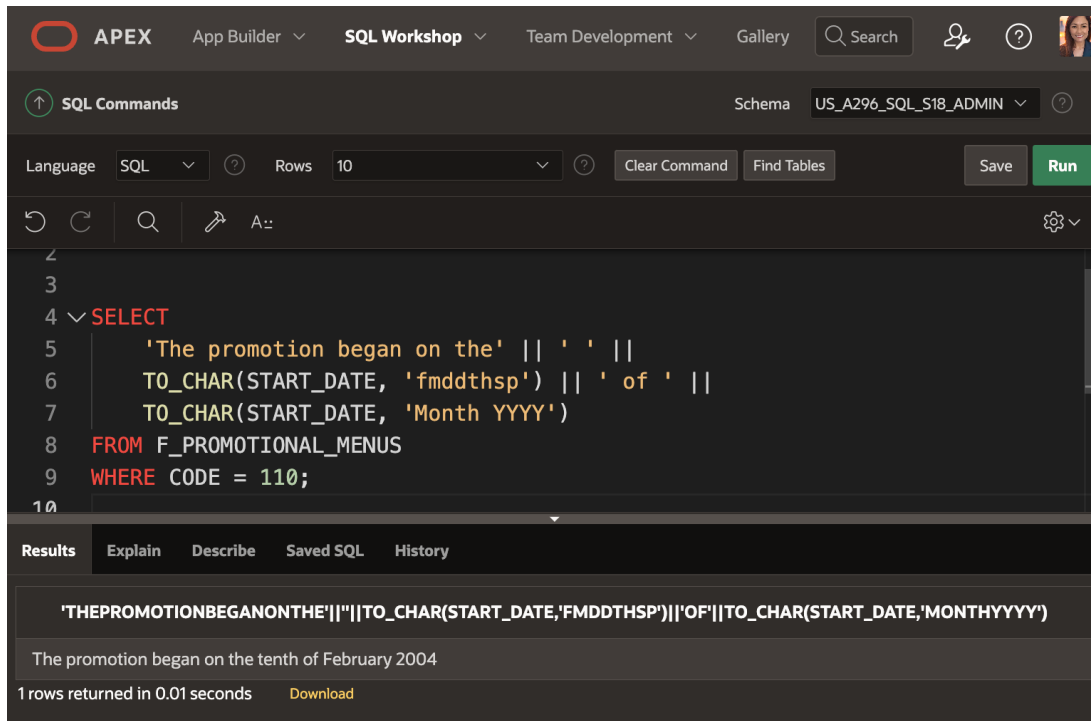
```
2  
3  
4 SELECT TO_DATE('JANUARY 3, 04', 'Month DD, RR') AS FORMAT_MODEL  
5 FROM DUAL  
6
```

The Results tab is selected, showing the output of the query:

FORMAT_MODEL
03-Jan-2004

1 rows returned in 0.01 seconds [Download](#)

3) Format a query from the Global Fast Foods f_promotional_menus table to print out the start_date of promotional code 110 as: The promotion began on the tenth of February 2004.



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

```

SELECT
    'The promotion began on the' || ' ' ||
    TO_CHAR(START_DATE, 'fmddthsp') || ' of ' ||
    TO_CHAR(START_DATE, 'Month YYYY')
FROM F_PROMOTIONAL_MENUS
WHERE CODE = 110;

```

The results pane shows the output of the query:

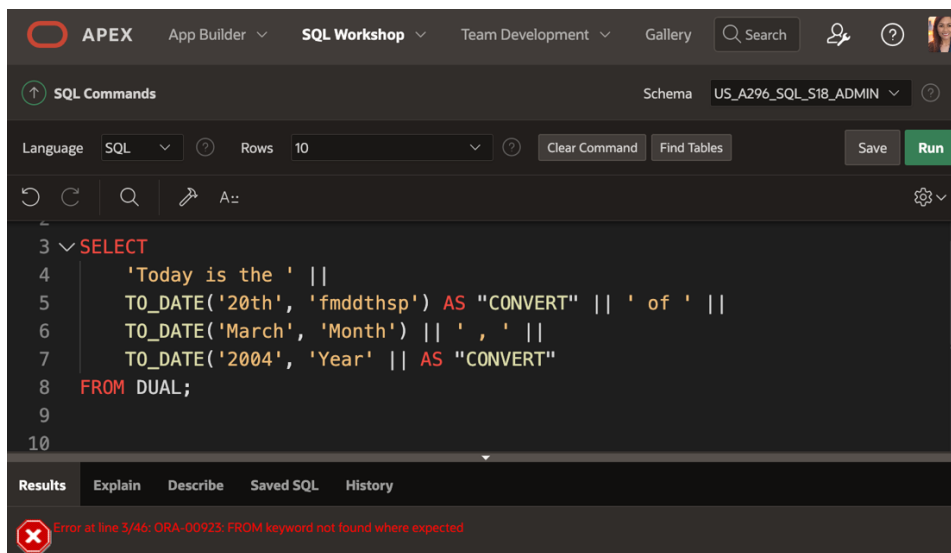
```

'THEPROMOTIONBEGANONTHE'||'||TO_CHAR(START_DATE,'FMDDTHSP')||'OF'||TO_CHAR(START_DATE,'MONTHYYYY')

```

Below the output, the text "The promotion began on the tenth of February 2004" is displayed. At the bottom, it states "1 rows returned in 0.01 seconds" with a "Download" link.

4) Convert today's date to a format such as: "Today is the Twentieth of March, Two Thousand Four"
I attempted to use multiple queries to come up with the correct answer. However, I was not successful.



The screenshot shows the APEX SQL Workshop interface with an error message. The SQL command is as follows:

```

SELECT
    'Today is the ' ||
    TO_DATE('20th', 'fmddthsp') AS "CONVERT" || ' of ' ||
    TO_DATE('March', 'Month') || ', ' ||
    TO_DATE('2004', 'Year') || AS "CONVERT"
FROM DUAL;

```

The results pane shows an error message: "Error at line 3/46: ORA-00923: FROM keyword not found where expected".

The screenshot shows the APEX SQL Workshop interface. The SQL command area contains the following query:

```

1
2
3
4 SELECT
5     'Today is the ' ||
6     TO_DATE('20', 'fxddthsp') AS "CONVERT" || ' of ' ||
7     TO_DATE('March', 'fxMonth') AS "CONVERT" || ', ' ||
8     TO_DATE('2004', 'fxYear') AS "CONVERT"
9 FROM DUAL;

```

The error message at the bottom states: "Error at line 3/44: ORA-00923: FROM keyword not found where expected".

5) List the ID, name, and salary for all Global Fast Foods employees. Display salary with a \$ sign and two decimal places.

The screenshot shows the APEX SQL Workshop interface with a successful query. The SQL command area contains the following query:

```

1
2
3
4 SELECT
5     ID,
6     FIRST_NAME || ' ' || LAST_NAME,
7     TO_CHAR(SALARY, '$99.99') AS "SALARY"
8 FROM F_STAFFS;
9
10

```

The Results tab shows the following data:

ID	FIRST_NAME " " LAST_NAME	SALARY
12	Sue Doe	\$6.75
9	Bob Miller	\$10.00
19	Monique Tuttle	\$60.00

3 rows returned in 0.01 seconds [Download](#)

6) Ellen Abel is an employee who has received a \$2,000 raise. Display her first name and last name, her current salary, and her new salary. Display both salaries with a \$ and two decimal places. Label her new salary column AS New Salary.

The screenshot shows the APEX SQL Workshop interface. The SQL command area contains the following query:

```

4 SELECT
5     FIRST_NAME,
6     LAST_NAME,
7     TO_CHAR(SALARY, '$99999.99') AS "CURRENT_SALARY"
8     TO_CHAR(SALARY + $2000, '$99999.99') AS "NEW_SALARY"
9 FROM EMPLOYEES
10 WHERE
11     FIRST_NAME = 'ELLEN'
12 AND
13     LAST_NAME = 'ABEL';
  
```

The interface shows a schema of US_A296_SQL_S18_ADMIN. Below the query, the Results tab is active, displaying an error message: "Error at line 5/5: ORA-00923: FROM keyword not found where expected".

7) On what day of the week and date did Global Fast Foods' promotional code 110 Valentine's Special begin?

The screenshot shows the APEX SQL Workshop interface. The SQL command area contains the following query:

```

1 SELECT
2     TO_CHAR(START_DATE, 'fmDay ddth Mon, YYYY') AS "VALENTINES_SPECIAL"
3 FROM F_PROMOTIONAL_MENU
4 WHERE CODE = 110;
5
6
  
```

The interface shows a schema of US_A296_SQL_S18_ADMIN. Below the query, the Results tab is active, displaying the results of the query:

VALENTINES_SPECIAL
Tuesday 10th Feb, 2004

1 rows returned in 0.00 seconds [Download](#)

8) Create one query that will convert 25-Dec-2004 into each of the following (you will have to convert 25-Dec-2004 to a date and then to character data):

December 25th, 2004

DECEMBER 25TH, 2004

25th december, 2004

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

```

1 SELECT
2     TO_CHAR(TO_DATE('25-Dec-2004', 'DD-Mon-YYYY'), 'Month ddth, YYYY'),
3     TO_CHAR(TO_DATE('25-Dec-2004', 'DD-Mon-YYYY'), 'Month DDth, YYYY'),
4     TO_CHAR(TO_DATE('25-Dec-2004', 'DD-Mon-YYYY'), 'ddth month, YYYY')
5 FROM DUAL;

```

The results tab shows the output of the query:

TO_CHAR(TO_DATE('25-DEC-2004','DD-MON-YYYY'),MONTHDDTH,YYYY')	TO_CHAR(TO_DATE('25-DEC-2004','DD-MON-YYYY'),MONTHDDTH,YYYY')	TO_CHAR(TO_DATE('25-DEC-2004','DD-MON-YYYY'),DDTHMONTH,YYYY')
December 25th, 2004	December 25TH, 2004	25th december , 2004

1 rows returned in 0.00 seconds

9) Create a query that will format the DIs on Demand d_packages columns, low-range and high-range package costs, in the format \$2500.00.

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

```

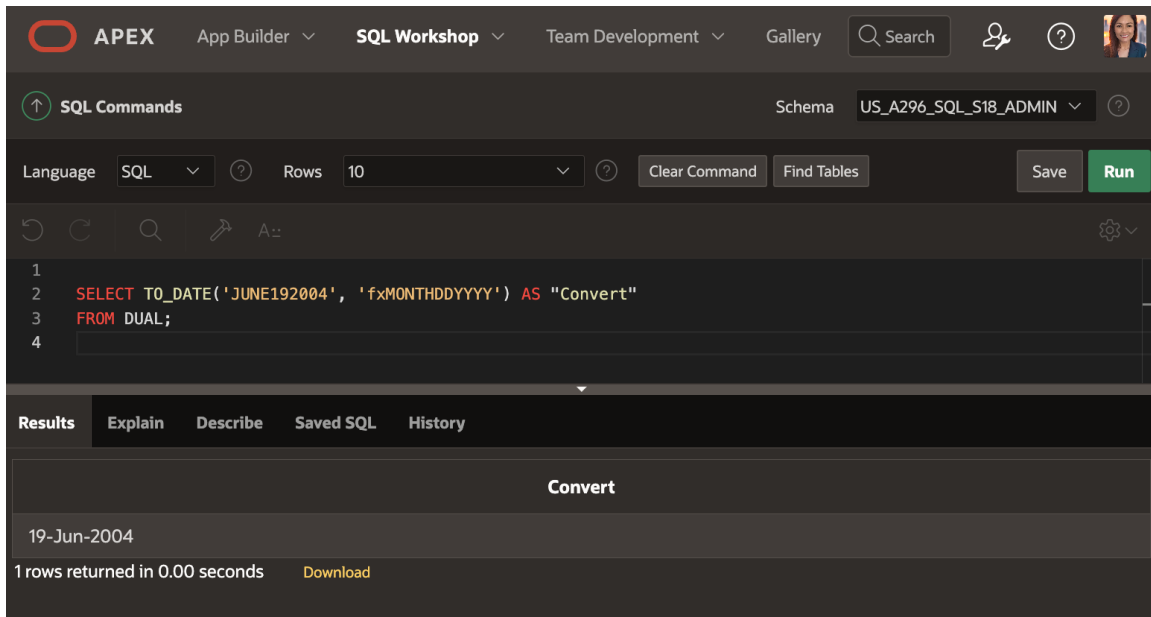
1 SELECT
2     D_PACKAGES
3     TO_NUMBER('LOW_PACKAGE_COST', '$9999.99') AS "LOW_RANGE"
4     TO_NUMBER('HIGH_PACKAGE_COST', '$9999.99') AS "HIGH_RANGE"

```

The results tab shows an error message:

Error at line 3/14: ORA-00923: FROM keyword not found where expected

10) Convert JUNE192004 to a date using the fx format model.



The screenshot shows the APEX SQL Workshop interface. At the top, there's a navigation bar with 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. Below this, the 'SQL Commands' section is active, showing a schema of 'US_A296_SQL_S18_ADMIN'. The SQL command entered is: `SELECT TO_DATE('JUNE192004', 'fxMONTHDDYYYY') AS "Convert" FROM DUAL;`. The results section shows a single row with the value '19-Jun-2004' under the column 'Convert'. The status bar indicates '1 rows returned in 0.00 seconds'.

11) What is the distinction between implicit and explicit datatype conversion? Give an example of each.

- **IMPLICIT DATA TYPE:** Oracle Server can automatically convert VARCHAR2 and CHAR data to NUMBER and DATE data type.
 - **Example:**
`SELECT 'STUDENT_ID: ' || STUDENT_ID FROM STUDENTS;`—>is a number column--this will implicitly convert to VARCHAR2 by Oracle
- **EXPLICIT DATA TYPE:** We can use special functions to directly instruct Oracle to transform a value from its current data type into a different one even though Oracle can automatically handle data type changes.
 - **Example:**
`SELECT TO_DATE('Nov23,2024', 'fxMonDD,YYYY') AS "Convert" FROM DUAL;`

12) Why is it important from a business perspective to have datatype conversions?

I'm not an expert but I believe utilizing data type conversions can greatly reduce errors. For instance, when explicitly converting data types ensures that operations are performed on compatible values to prevent incompatible or mismatching data types.

SQL Database Programming: Section 5-2: NULL Functions

Vocabulary

NVL function – Converts nulls to an actual value

COALESCE – Returns the first non-null expression in the list

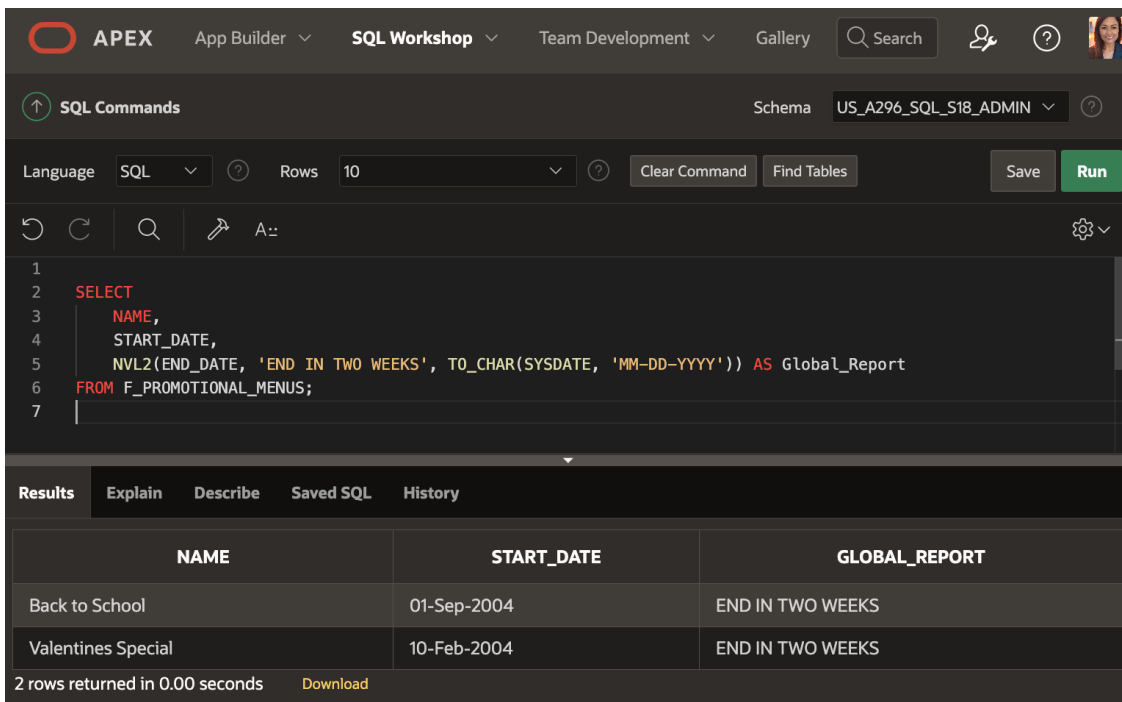
NVL2 – Examines the first expression; if the first expression is not null, it returns the second expression; if the first expression is null, it returns the third expression

NULLIF – Compares two expressions; if they are equal, the function returns null; if they are not equal, the function returns the first expression

Try It / Solve It

Use aliases to make the output more readable.

1) Create a report that shows the Global Fast Foods promotional name, start date, and end date from the f_promotional_menus table. If there is an end date, temporarily replace it with “end in two weeks.” If there is no end date, replace it with today’s date.



The screenshot shows the APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. The 'SQL Commands' tab is active, showing a schema of 'US_A296_SQL_S18_ADMIN'. The SQL editor contains the following query:

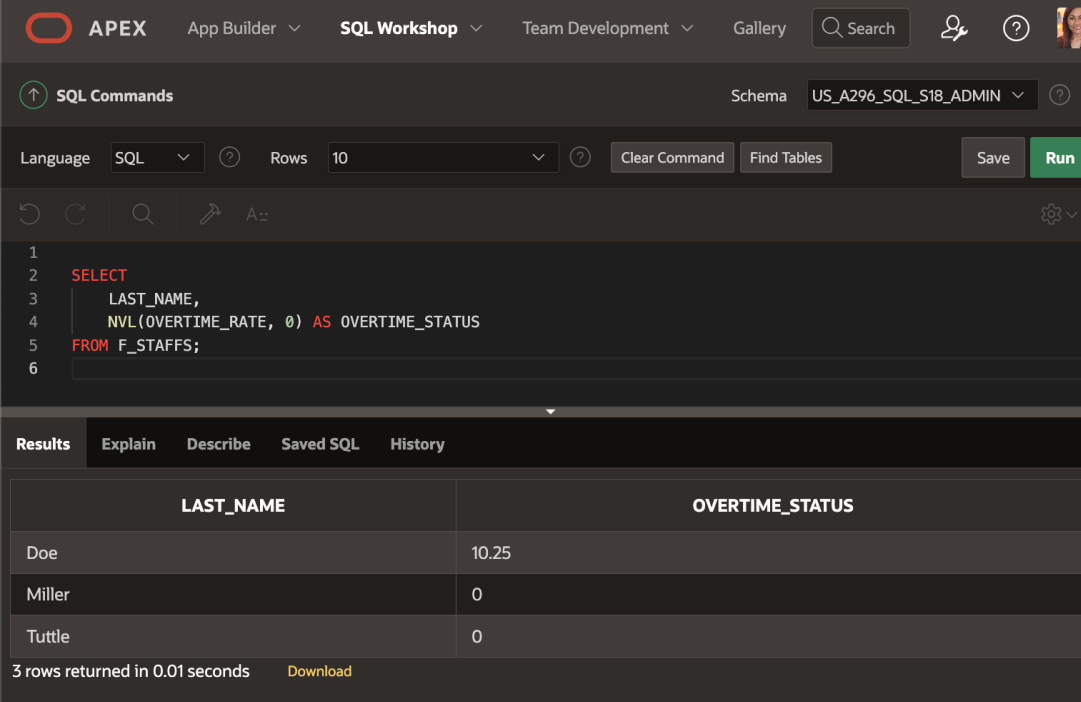
```
1  
2 SELECT  
3     NAME,  
4     START_DATE,  
5     NVL2(END_DATE, 'END IN TWO WEEKS', TO_CHAR(SYSDATE, 'MM-DD-YYYY')) AS Global_Report  
6 FROM F_PROMOTIONAL_MENUS;  
7
```

The 'Results' tab is selected, displaying a table with the following data:

NAME	START_DATE	GLOBAL_REPORT
Back to School	01-Sep-2004	END IN TWO WEEKS
Valentines Special	10-Feb-2004	END IN TWO WEEKS

At the bottom, it indicates '2 rows returned in 0.00 seconds' and provides a 'Download' link.

2) Not all Global Fast Foods staff members receive overtime pay. Instead of displaying a null value for these employees, replace null with zero. Include the employee's last name and overtime rate in the output. Label the overtime rate as "Overtime Status".



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

```

1
2 SELECT
3     LAST_NAME,
4     NVL(OVERTIME_RATE, 0) AS OVERTIME_STATUS
5 FROM F_STAFFS;
6

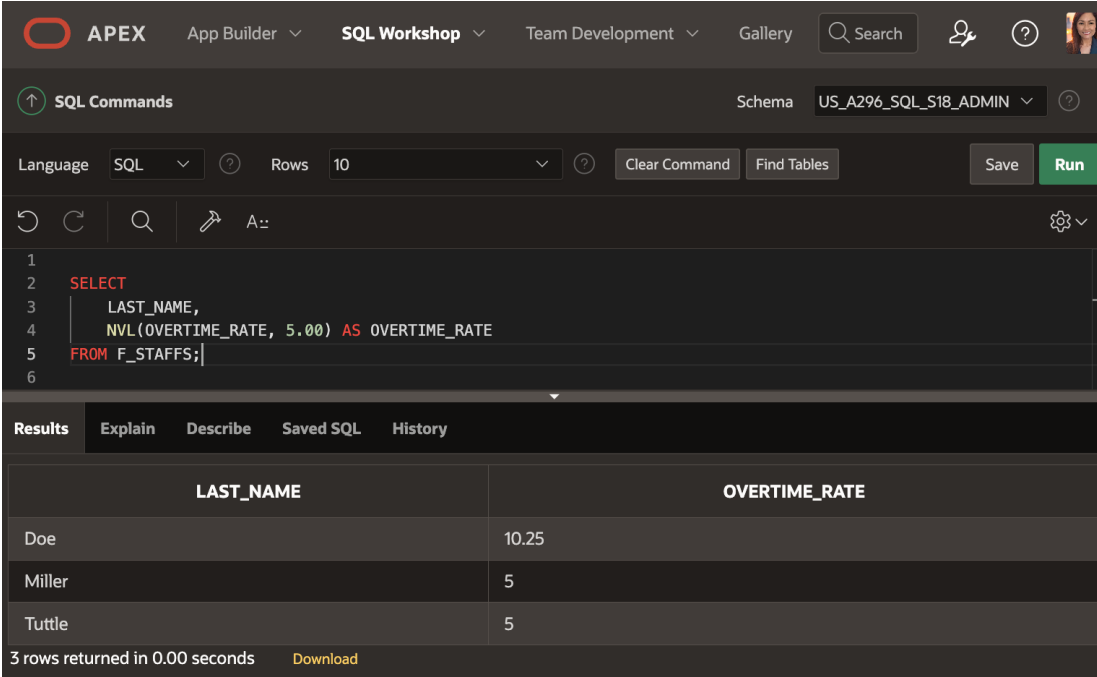
```

The results table displays the following data:

LAST_NAME	OVERTIME_STATUS
Doe	10.25
Miller	0
Tuttle	0

3 rows returned in 0.01 seconds

3) The manager of Global Fast Foods has decided to give all staff who currently do not earn overtime an overtime rate of \$5.00. Construct a query that displays the last names and the overtime rate for each staff member, substituting \$5.00 for each null overtime value. and/or its affiliates. and/or its affiliates.



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

```

1
2 SELECT
3     LAST_NAME,
4     NVL(OVERTIME_RATE, 5.00) AS OVERTIME_RATE
5 FROM F_STAFFS;
6

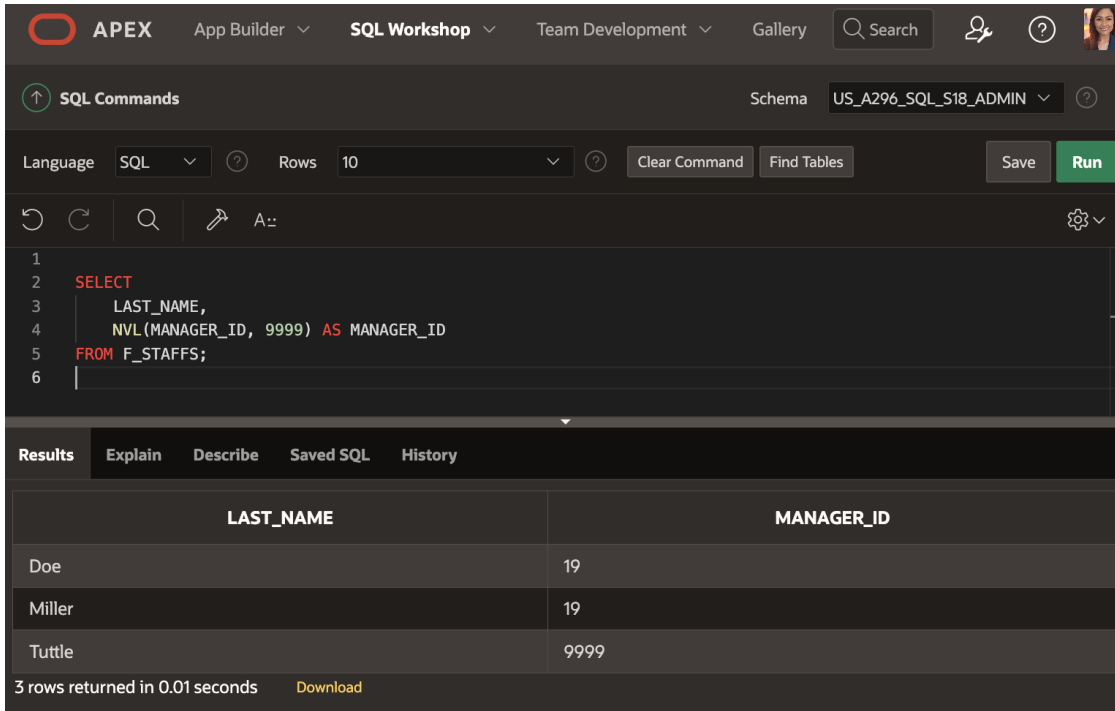
```

The results table displays the following data:

LAST_NAME	OVERTIME_RATE
Doe	10.25
Miller	5
Tuttle	5

3 rows returned in 0.00 seconds

4) Not all Global Fast Foods staff members have a manager. Create a query that displays the employee last name and 9999 in the manager ID column for these employees.



The screenshot shows the APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. The 'SQL Commands' tab is active, showing a query in the editor. The schema is set to 'US_A296_SQL_S18_ADMIN'. The query is as follows:

```

1 SELECT
2   LAST_NAME,
3   NVL(MANAGER_ID, 9999) AS MANAGER_ID
4 FROM F_STAFFS;

```

The 'Results' tab is selected, displaying a table with two columns: 'LAST_NAME' and 'MANAGER_ID'. The table contains three rows of data:

LAST_NAME	MANAGER_ID
Doe	19
Miller	19
Tuttle	9999

At the bottom of the results section, it states '3 rows returned in 0.01 seconds' and provides a 'Download' link.

5) Which statement(s) below will return null if the value of v_sal is 50?

- a. SELECT nvl(v_sal, 50) FROM emp;
- b. SELECT nvl2(v_sal, 50) FROM emp;
- c. SELECT nullif(v_sal, 50) FROM emp;
- d. SELECT coalesce (v_sal, Null, 50) FROM emp;

<<< MORE ANSWERS ON THE NEXT PAGE >>>

6. What does this query on the Global Fast Foods table return?
- ```
SELECT COALESCE(last_name, to_char(manager_id)) as NAME
FROM f_staffs;
```

The screenshot shows the APEX SQL Workshop interface. At the top, there's a navigation bar with 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar and user profile are also present. Below this, the 'SQL Commands' section is active, showing the schema 'US\_A296\_SQL\_S18\_ADMIN'. The language is set to 'SQL' and the number of rows to display is '10'. The query being executed is:

```
1
2 SELECT COALESCE(LAST_NAME, TO_CHAR(MANAGER_ID)) AS NAME
3 FROM F_STAFFS;
4
```

The results are displayed in a table with one column, 'NAME'. The results are:

| NAME   |
|--------|
| Doe    |
| Miller |
| Tuttle |

At the bottom, it states '3 rows returned in 0.00 seconds' and provides a 'Download' link.

<<< MORE ANSWERS ON THE NEXT PAGE >>>

7)

- a. Create a report listing the first and last names and month of hire for all employees in the EMPLOYEES table (use TO\_CHAR to convert hire\_date to display the month).

The screenshot shows the APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. The 'SQL Commands' tab is active, showing a query in the 'SQL' language. The schema is set to 'US\_A296\_SQL\_S18\_ADMIN'. The query is as follows:

```

2 SELECT
3 FIRST_NAME,
4 LAST_NAME,
5 TO_CHAR(HIRE_DATE, 'MONTH') AS HIRE_DATE_IN_MONTH
6 FROM EMPLOYEES;

```

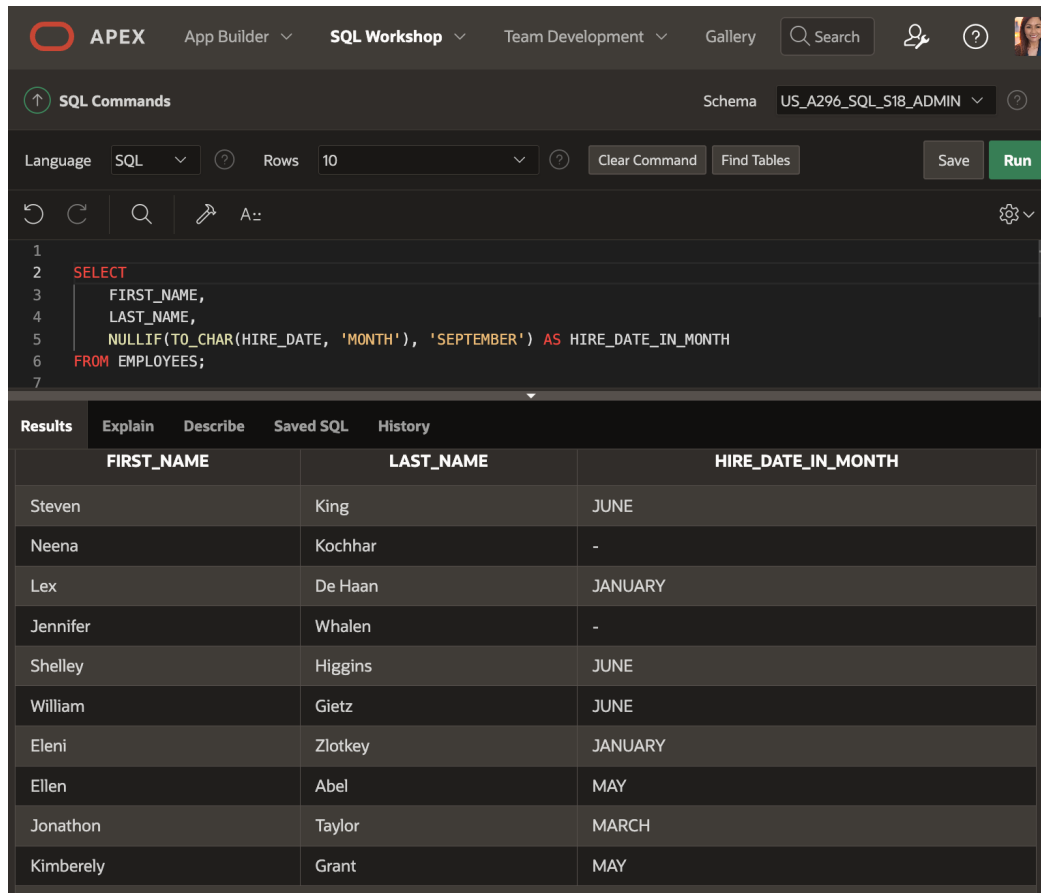
The 'Results' tab is selected, displaying a table with 10 rows. The table has three columns: 'FIRST\_NAME', 'LAST\_NAME', and 'HIRE\_DATE\_IN\_MONTH'. The data is as follows:

| FIRST_NAME | LAST_NAME | HIRE_DATE_IN_MONTH |
|------------|-----------|--------------------|
| Steven     | King      | JUNE               |
| Neena      | Kochhar   | SEPTEMBER          |
| Lex        | De Haan   | JANUARY            |
| Jennifer   | Whalen    | SEPTEMBER          |
| Shelley    | Higgins   | JUNE               |
| William    | Gietz     | JUNE               |
| Eleni      | Zlotkey   | JANUARY            |
| Ellen      | Abel      | MAY                |
| Jonathon   | Taylor    | MARCH              |
| Kimberely  | Grant     | MAY                |

At the bottom of the results section, it states: 'More than 10 rows available. Increase rows selector to view more rows.'

<<< MORE ANSWERS ON THE NEXT PAGE >>>

b. Modify the report to display null if the month of hire is September. Use the NULLIF function.



The screenshot shows the APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. The 'SQL Commands' section is active, showing a query in the 'US\_A296\_SQL\_S18\_ADMIN' schema. The query is:

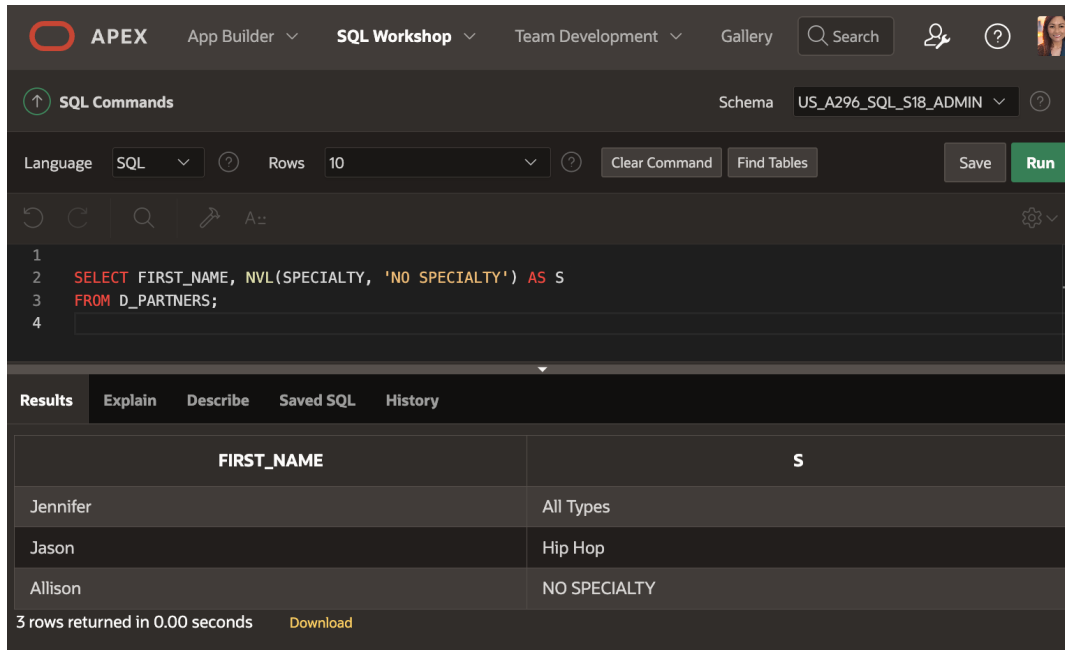
```
1
2 SELECT
3 FIRST_NAME,
4 LAST_NAME,
5 NULLIF(TO_CHAR(HIRE_DATE, 'MONTH'), 'SEPTEMBER') AS HIRE_DATE_IN_MONTH
6 FROM EMPLOYEES;
7
```

The 'Results' tab is selected, displaying a table with the following data:

| FIRST_NAME | LAST_NAME | HIRE_DATE_IN_MONTH |
|------------|-----------|--------------------|
| Steven     | King      | JUNE               |
| Neena      | Kochhar   | -                  |
| Lex        | De Haan   | JANUARY            |
| Jennifer   | Whalen    | -                  |
| Shelley    | Higgins   | JUNE               |
| William    | Gietz     | JUNE               |
| Eleni      | Zlotkey   | JANUARY            |
| Ellen      | Abel      | MAY                |
| Jonathon   | Taylor    | MARCH              |
| Kimberely  | Grant     | MAY                |

<<< MORE ANSWERS ON THE NEXT PAGE >>>

8. For all null values in the specialty column in the DJs on Demand d\_partners table, substitute “No Specialty.” Show the first name and s



The screenshot shows the APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. The 'SQL Commands' section is active, showing a schema of 'US\_A296\_SQL\_S18\_ADMIN'. The language is set to 'SQL' and the number of rows is set to '10'. The SQL command entered is:

```
1
2 SELECT FIRST_NAME, NVL(SPECIALTY, 'NO SPECIALTY') AS S
3 FROM D_PARTNERS;
4
```

The results are displayed in a table with two columns: 'FIRST\_NAME' and 'S'. The table contains three rows of data:

| FIRST_NAME | S            |
|------------|--------------|
| Jennifer   | All Types    |
| Jason      | Hip Hop      |
| Allison    | NO SPECIALTY |

At the bottom, it indicates '3 rows returned in 0.00 seconds' and provides a 'Download' link.

---

## SQL Database Programming: Section 5-3: Conditional Expressions

### Vocabulary

**DECODE** – Compares an expression to each of the search values

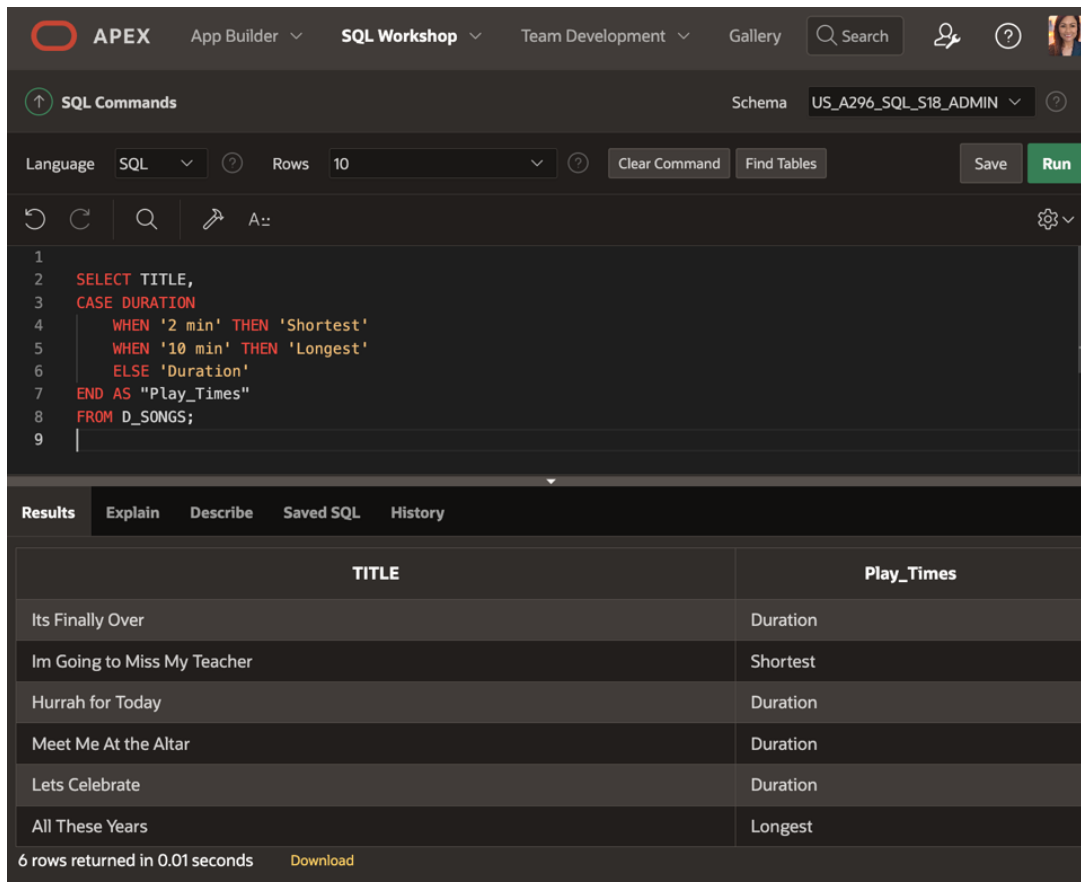
**CONDITIONAL EXPRESSIONS** – An if-then-else expression whose value depends on the truth- value of a Boolean expression.

**CASE** – Implements conditional processing within a SQL statement; it meets the ANSI standard.

<<< MORE ANSWERS ON THE NEXT PAGE >>>

## Try It / Solve It

1. From the DJs on Demand d\_songs table, create a query that replaces the 2-minute songs with “shortest” and the 10-minute songs with “longest”. Label the output column “Play Times”.



The screenshot shows the APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. The 'SQL Commands' tab is active, showing a schema of 'US\_A296\_SQL\_S18\_ADMIN'. The language is set to 'SQL' and the number of rows is set to '10'. The SQL command is as follows:

```
1 SELECT TITLE,
2 CASE DURATION
3 WHEN '2 min' THEN 'Shortest'
4 WHEN '10 min' THEN 'Longest'
5 ELSE 'Duration'
6 END AS "Play_Times"
7 FROM D_SONGS;
8
9
```

The results are displayed in a table with two columns: 'TITLE' and 'Play\_Times'. The table contains 6 rows of data. Below the table, it states '6 rows returned in 0.01 seconds' and provides a 'Download' link.

| TITLE                       | Play_Times |
|-----------------------------|------------|
| Its Finally Over            | Duration   |
| Im Going to Miss My Teacher | Shortest   |
| Hurrah for Today            | Duration   |
| Meet Me At the Altar        | Duration   |
| Lets Celebrate              | Duration   |
| All These Years             | Longest    |

<<< MORE ANSWERS ON THE NEXT PAGE >>>

2. Use the Oracle database employees table and CASE expression to decode the department id. Display the department id, last name, salary, and a column called “New Salary” whose value is based on the following conditions:

- If the department id is 10 then  $1.25 * \text{salary}$
- If the department id is 90 then  $1.5 * \text{salary}$
- If the department id is 130 then  $1.75 * \text{salary}$
- Otherwise, display the old salary.

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 SELECT DEPARTMENT_ID, LAST_NAME, SALARY,
3 DECODE(DEPARTMENT_ID,
4 10, SALARY * 1.25,
5 90, SALARY * 1.5,
6 130, SALARY * 1.75,
7 SALARY)
8 AS NEW_SALARY
9 FROM EMPLOYEES;

```

Results Explain Describe Saved SQL History

| DEPARTMENT_ID | LAST_NAME | SALARY | NEW_SALARY |
|---------------|-----------|--------|------------|
| 90            | King      | 24000  | 36000      |
| 90            | Kochhar   | 17000  | 25500      |
| 90            | De Haan   | 17000  | 25500      |
| 10            | Whalen    | 4400   | 5500       |
| 110           | Higgins   | 12000  | 12000      |
| 110           | Gietz     | 8300   | 8300       |
| 80            | Zlotkey   | 10500  | 10500      |
| 80            | Abel      | 11000  | 11000      |
| 80            | Taylor    | 8600   | 8600       |