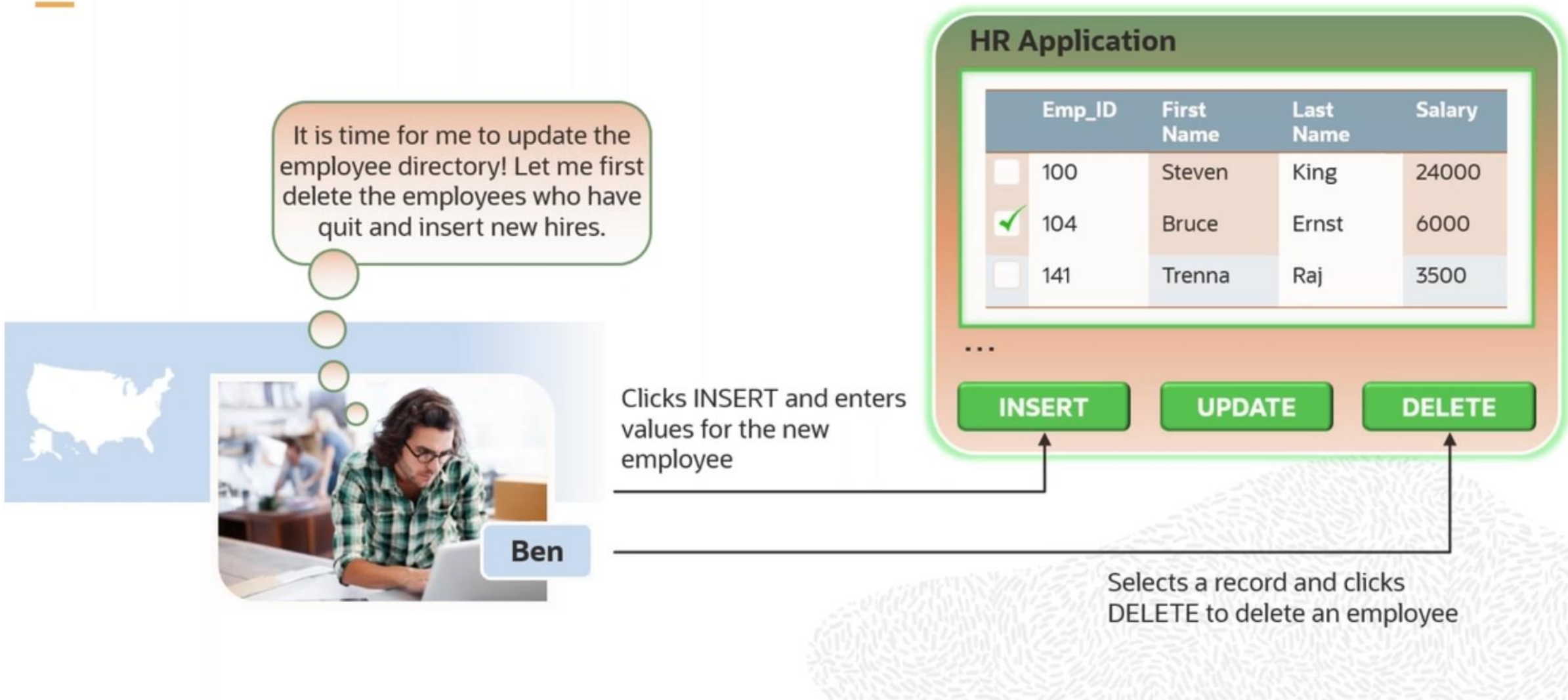
Managing Tables Using DML Statements in Oracle

Objectives

After completing this lesson, you should be able to do the following:

- Describe each data manipulation language (DML) statement
- Control transactions

HR Application Scenario

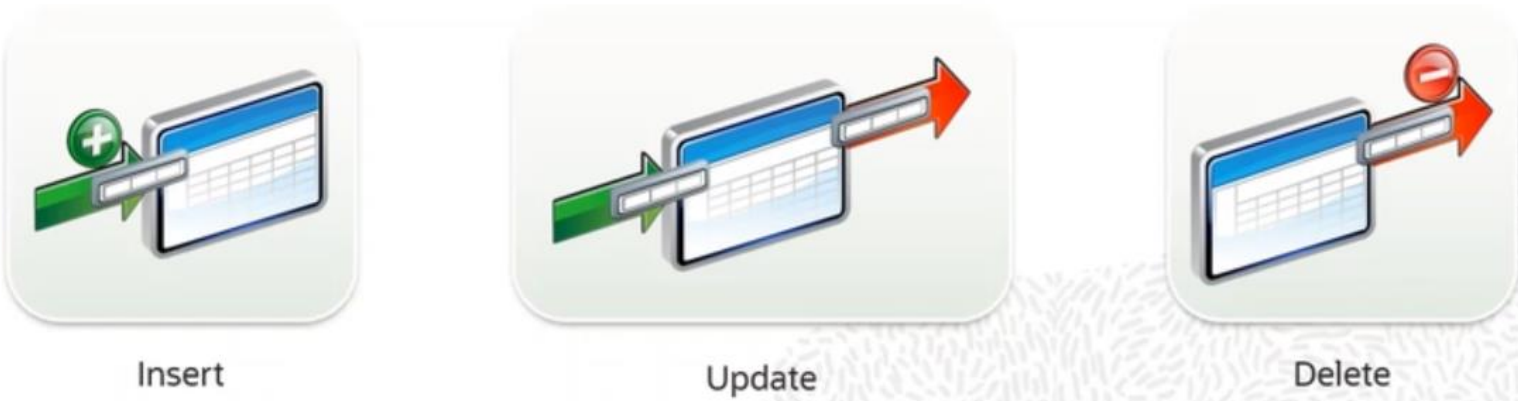


Lesson Agenda

- Adding new rows in a table
  - `INSERT` statement
- Changing data in a table
  - `UPDATE` statement
- Removing rows from a table:
  - `DELETE` statement
  - `TRUNCATE` statement
- Database transaction control using `COMMIT`, `ROLLBACK`, and `SAVEPOINT`
- Read consistency
- Manual Data Locking
  - FOR `UPDATE` clause in a `SELECT` statement
  - `LOCK TABLE` statement

Data Manipulation Language

- A DML statement is executed when you:
  - Add new rows to a table
  - Modify existing rows in a table
  - Remove existing rows from a table
- A *transaction* consists of a collection of DML statements that form a logical unit of work.



Adding a New Row to a Table

DEPARTMENTS

	70	Public Relations	100	1700

New row

	DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
1	10	Administration	200	1700
2	20	Marketing	201	1800
3	50	Shipping	124	1500
4	60	IT	103	1400
5	80	Sales	149	2500
6	90	Executive	100	1700
7	110	Accounting	205	1700
8	190	Contracting	(null)	1700

Insert a new row into the DEPARTMENTS table.

	DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
1	70	Public Relations	100	1700
2	10	Administration	200	1700
3	20	Marketing	201	1800
4	50	Shipping	124	1500
5	60	IT	103	1400
6	80	Sales	149	2500
7	90	Executive	100	1700
8	110	Accounting	205	1700
9	190	Contracting	(null)	1700

INSERT Statement Syntax

- Add new rows to a table by using the INSERT statement.

```
INSERT INTO   table [(column [, column...])]
VALUES        (value [, value...]);
```

- With this syntax, only one row is inserted at a time.

Inserting New Rows

- Insert a new row containing values for each column.
- List values in the default order of the columns in the table.
- Optionally, list the columns in the `INSERT` clause.

```
INSERT INTO departments(department_id,
       department_name, manager_id, location_id)
VALUES (70, 'Public Relations', 100, 1700);
```

```
1 row inserted.
```

- Enclose character and date values within single quotation marks.

Inserting Rows with Null Values

- Implicit method: Omit the column from the column list.

```
INSERT INTO   departments (department_id,
                           department_name)
VALUES        (30, 'Purchasing');
```

```
1 row inserted.
```

- Explicit method: Specify the `NULL` keyword in the `VALUES` list.

```
INSERT INTO   departments
VALUES        (100, 'Finance', NULL, NULL);
```

```
1 row inserted.
```

Inserting Special Values

The CURRENT_DATE function records the current date and time in Oracle.

```
INSERT INTO employees (employee_id,
                       first_name, last_name,
                       email, phone_number,
                       hire_date, job_id, salary,
                       commission_pct, manager_id,
                       department_id)
VALUES                 (113,
                       'Louis', 'Popp',
                       'LPOPP', '515.124.4567',
                       CURRENT_DATE, 'AC_ACCOUNT', 6900,
                       NULL, 205, 110);
```

```
1 row inserted.
```

Inserting Specific Date and Time Values

- Add a new employee.

```
INSERT INTO employees
VALUES      (114,
             'Den', 'Raphealy',
             'DRAPHEAL', '515.127.4561',
             TO_DATE('FEB 3, 2016', 'MON DD, YYYY'),
             'SA_REP', 11000, 0.2, 100, 70);
```

```
1 row inserted.
```

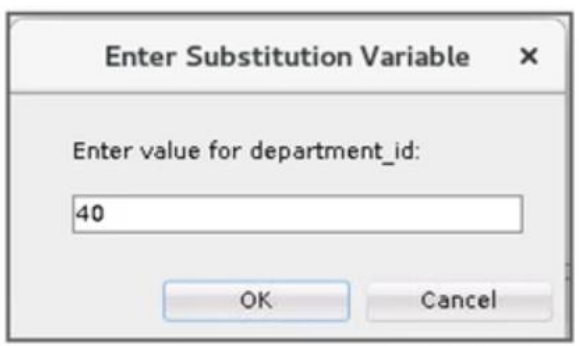
- Verify your addition.

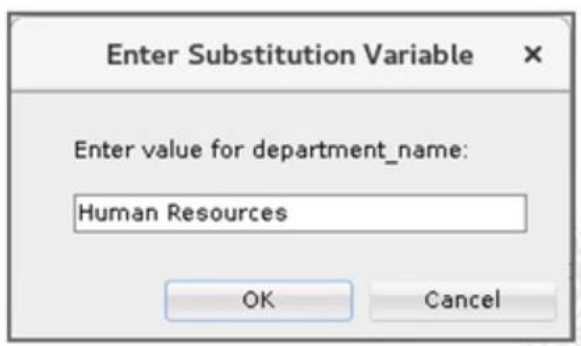
	EMPLOYEE_ID	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER	HIRE_DATE	JOB_ID	SALARY	COMMISSION_PCT	MANAGER_ID	DEPARTMENT_ID
1	114	Den	Raphealy	DRAPHEAL	515.127.4561	03-FEB-16	SA_REP	11000	0.2	100	70

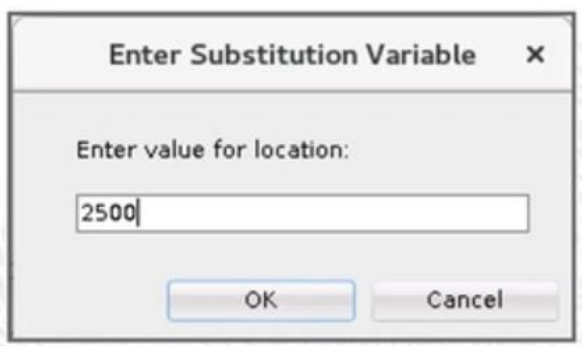
Creating a Script

- Use the & substitution in a SQL statement to prompt for values.
- & is a placeholder for the variable value.

```
INSERT INTO departments
            (department_id, department_name, location_id)
VALUES      (&department_id, '&department_name',&location);
```







Copying Rows from Another Table

- Write your `INSERT` statement with a subquery:

```
INSERT INTO sales_reps(id, name, salary, commission_pct)
  SELECT employee_id, last_name, salary, commission_pct
  FROM   employees
  WHERE  job_id LIKE '%REP%';
```

```
5 rows inserted.
```

- Do not use the `VALUES` clause.
- Match the number of columns in the `INSERT` clause to those in the subquery.
- Inserts all the rows returned by the subquery in the table, `sales_reps`.

Changing Data in a Table

EMPLOYEES

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	SALARY	MANAGER_ID	COMMISSION_PCT	DEPARTMENT_ID
100	Steven	King	24000	(null)	(null)	90
101	Neena	Kochhar	17000	100	(null)	90
102	Lex	De Haan	17000	100	(null)	90
103	Alexander	Hunold	9000	102	(null)	60
104	Bruce	Ernst	6000	103	(null)	60
107	Diana	Lorentz	4200	103	(null)	60
124	Kevin	Mourgos	5800	100	(null)	50

Update rows in the EMPLOYEES table:

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	SALARY	MANAGER_ID	COMMISSION_PCT	DEPARTMENT_ID
100	Steven	King	24000	(null)	(null)	90
101	Neena	Kochhar	17000	100	(null)	90
102	Lex	De Haan	17000	100	(null)	90
103	Alexander	Hunold	9000	102	(null)	80
104	Bruce	Ernst	6000	103	(null)	80
107	Diana	Lorentz	4200	103	(null)	80
124	Kevin	Mourgos	5800	100	(null)	50

UPDATE Statement Syntax

- Modify existing values in a table with the UPDATE statement:

```
UPDATE          table
SET       column = value [, column = value, ...]
[WHERE          condition];
```

- Update more than one row at a time (if required).

Updating Rows in a Table

- Values for a specific row or rows are modified if you specify the WHERE clause:

```
UPDATE employees
SET    department_id = 50
WHERE  employee_id = 113;
```

```
1 row updated.
```

- Values for all the rows in the table are modified if you omit the WHERE clause:

```
UPDATE     copy_emp
SET        department_id = 110;
```

```
22 rows updated
```

- Specify SET column_name= NULL to update a column value to NULL.

Updating Two Columns with a Subquery

Update employee 103's job and salary to match those of employee 205.

```
UPDATE    employees
SET       (job_id,salary)  = (SELECT  job_id,salary
                              FROM    employees
                                WHERE   employee_id = 205)
          WHERE     employee_id    =  103;
```

```
1 row updated.
```

Updating Rows Based on Another Table

Use the subqueries in the `UPDATE` statements to update row values in a table based on values from another table:

```
UPDATE   copy_emp
SET      department_id  =  (SELECT department_id
                           FROM employees
                           WHERE employee_id = 100)
WHERE    job_id         =  (SELECT job_id
                           FROM employees
                           WHERE employee_id = 200);
```

```
1 row updated.
```

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Removing a Row from a Table

DEPARTMENTS

	DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
1	10	Administration	200	1700
2	20	Marketing	201	1800
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4	60	IT	103	1400
5	80	Sales	149	2500
6	90	Executive	100	1700
7	110	Accounting	205	1700
8	190	Contracting	(null)	1700

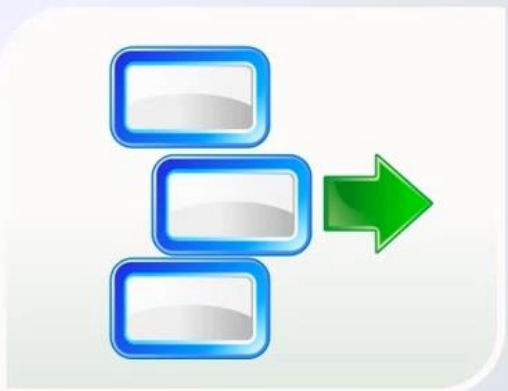
Delete a row from the DEPARTMENTS table:

	DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
1	10	Administration	200	1700
2	20	Marketing	201	1800
3	50	Shipping	124	1500
4	60	IT	103	1400
5	80	Sales	149	2500
6	90	Executive	100	1700
7	110	Accounting	205	1700

DELETE Statement

You can remove existing rows from a table by using the DELETE statement:

```
DELETE [FROM]     table
[WHERE       condition];
```



Deleting Rows from a Table

- Specific rows are deleted if you specify the `WHERE` clause:

```
DELETE FROM departments
WHERE  department_name = 'Finance';
```

```
1 row deleted.
```

- All rows in the table are deleted if you omit the `WHERE` clause:

```
DELETE FROM  copy_emp;
```

```
22 rows deleted
```

Deleting Rows Based on Another Table

Use the subqueries in the `DELETE` statements to remove rows from a table based on values from another table:

```
DELETE FROM employees
WHERE  department_id IN
                    (SELECT department_id
                     FROM   departments
                     WHERE  department_name
                            LIKE '%Public%');
```

```
1 row deleted.
```

TRUNCATE Statement

- Removes all rows from a table, leaving the table empty and the table structure intact
- Is a data definition language (DDL) statement rather than a DML statement; cannot be undone
- Syntax:

```
TRUNCATE TABLE table_name;
```

- Example:

```
TRUNCATE TABLE copy_emp;
```