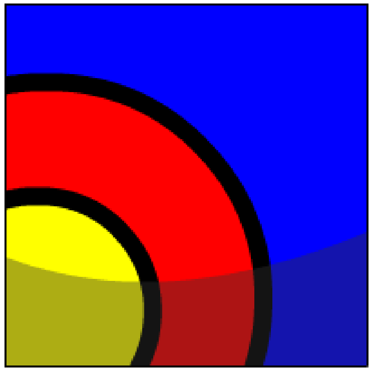
Updating Column Values and Deleting Rows

What Will I Learn?

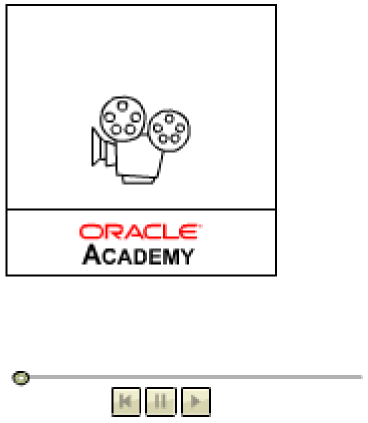
In this lesson, you will learn to:

- Construct and execute an UPDATE statement
- Construct and execute a DELETE statement
- Construct and execute a query that uses a subquery to update and delete data from a table
- Construct and execute a query that performs updates or deletes based on correlated subqueries
- Explain how foreign-key and primary-key integrity constraints affect UPDATE and DELETE statements



Why Learn It?

Wouldn't it be a wonderful world if, once you got something done, it never needed to be changed or redone? Your bed would stay made, your clothes would stay clean, and you'd always be getting passing grades. Unfortunately, in databases, as in life, "There is nothing permanent except change."



Updating, inserting, deleting, and managing data is a Database Administrator's (DBA's) job. In this lesson, you will become the DBA of your own schema and learn to manage your database.

Tell Me / Show Me

UPDATE

The UPDATE statement is used to modify existing rows in a table. It requires four values:

- the name of the table
- the name of the column(s) whose values will be modified
- a new value for each of the column(s) being modified
- a condition that identifies which rows in the table will be modified.

The new value for a column can be the result of a single-row subquery.

Tell Me / Show Me

UPDATE

The example shown uses an UPDATE statement to change the phone number of one customer in the Global Fast Foods database. Note that the copy_f_customers table is used in this transaction.

```
UPDATE copy_f_customers
  SET phone_number='4475582344'
  WHERE id=123;
```

ID	FIRST_NAME	LAST_NAME	ADDRESS	CITY	STATE	ZIP	PHONE_NO
123	Cole	Bee	123 Main Street	Orlando	FL	32838	4475582344
456	Zoe	Twee	1009 Oliver Avenue	Boston	MA	12889	7098675309
145	Katie	Hernandez	92 Chico Way	Los Angeles	CA	98008	8586667641

Tell Me / Show Me

UPDATE

We can change several columns and/or several rows in one UPDATE statement.

This example changes both the phone number and the city for two Global Fast Foods customers.

```
UPDATE copy_f_customers
  SET phone_number='4475582344‘,
          city = ‘Chicago’
  WHERE id < 200;
```

ID	FIRST_NAME	LAST_NAME	ADDRESS	CITY	STATE	ZIP	PHONE_NO
123	Cole	Bee	123 Main Street	Chicago	FL	32838	4475582344
456	Zoe	Twee	1009 Oliver Avenue	Boston	MA	12889	7098675309
145	Katie	Hernandez	92 Chico Way	Chicago	CA	98008	4475582344

Tell Me / Show Me

UPDATE

Which rows would be updated in the following transaction?

```
UPDATE copy_f_customers
SET phone_number='9876543210';
```

ID	FIRST_ NAME	LAST_ NAME	ADDRESS	CITY	STATE	ZIP	PHONE_NO
123	Cole	Bee	123 Main Street	Orlan do	FL	32838	4475582344
456	Zoe	Twee	1009 Oliver Avenue	Bosto n	MA	12889	7098675309
145	Katie	Hernandez	92 Chico Way	Los Angel e	CA	98008	8586667641

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Updating a Column with a value from a Subquery

We can use the result of a single-row subquery to provide the new value for an updated column.

```
UPDATE copy_f_staffs
SET salary  = (SELECT  salary
               FROM copy_f_staffs
               WHERE   id = 9)
WHERE id = 12;
```

This example changes the salary of one employee (id = 12) to the same salary as another employee (id = 9). As usual, the subquery executes first and retrieves the salary for employee id=12. This salary value is then used to update the salary for employee id=9.

ID	FIRST_NAME	LAST_NAME	SALARY
9	Bob	Miller	10
12	Sue	Doe	10

Tell Me / Show Me

Updating Two Columns with Two Subquery Statements

To update several columns in one UPDATE statement, it is possible to write multiple single-row subqueries, one for each column.

In this example the UPDATE statement changes the salary and staff type of one employee (id = 12) to the same values as another employee (id = 9).

```
UPDATE  copy_f_staffs
SET salary       =  (SELECT  salary
                     FROM   copy_f_staffs
                     WHERE   id = 9),
       staff_type  = (SELECT  staff_type
                     FROM   copy_f_staffs
                     WHERE   id = 9)
WHERE id  = 12;
```

ID	FIRST_NAME	LAST_NAME	SALARY	STAFF_TYPE
9	Bob	Miller	10	Cook
12	Sue	Doe	10	Cook

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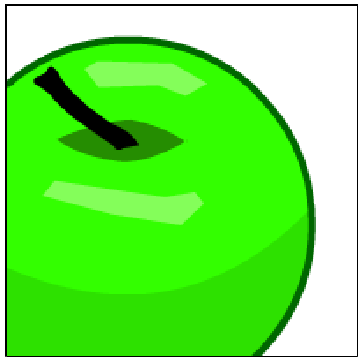
UPDATING ROWS BASED ON ANOTHER TABLE



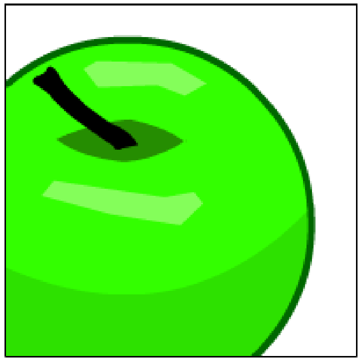
As you may have expected, the subquery can retrieve information from one table which is then used to update another table.

In this example, a copy of the f_staffs table was created. Then data from the original f_staffs table was retrieved, copied, and used to populate the copy of the f_staffs table.

```
UPDATE  copy_f_staffs
SET salary  = (SELECT salary
               FROM f_staffs
               WHERE id = 9)
WHERE id  = 9;
```

Tell Me / Show Me

UPDATING ROWS BASED ON THE SAME TABLE



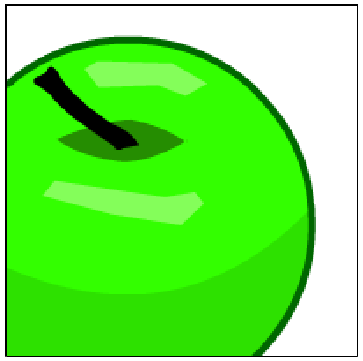
As you already know subqueries can be either stand alone or correlated. In a correlated subquery you are updating a row in a table based on a select from that same table.

In the example below, a copy of the department name column was created in the employees table. Then data from the original departments table was retrieved, copied and used to populate the copy of the column in the employees table.

```
UPDATE  employees e
SET e.department_name  = (SELECT d.department_name
                          FROM departments d
                          WHERE e.department_id =
                                d.department_id);
```

Tell Me / Show Me

DELETE



The DELETE statement is used to remove existing rows in a table. The statement requires two values:

- the name of the table
- the condition that identifies the rows to be deleted

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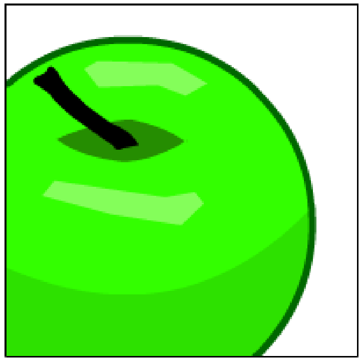

DELETE

The example shown uses the Global Fast Foods database to delete one row, the customer with ID number 123.

```
DELETE FROM copy_f_customers
WHERE ID= 123;
```

What do you predict will be deleted if the WHERE clause is eliminated in a DELETE statement?

All rows in the table are deleted if you omit the WHERE clause.

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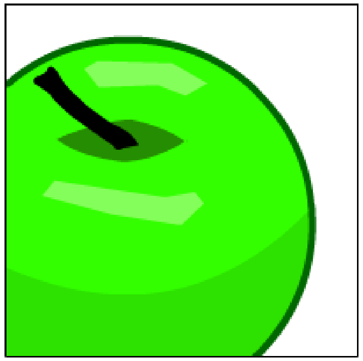

SUBQUERY DELETE

Subqueries can also be used in DELETE statements.

The example shown deletes rows from the employees table for all employees who work in the Shipping department. Maybe this department has been renamed or eliminated.

```
DELETE FROM employees
WHERE  department_id =
           (SELECT department_id
           FROM   departments
           WHERE  department_name = ‘Shipping’');
```

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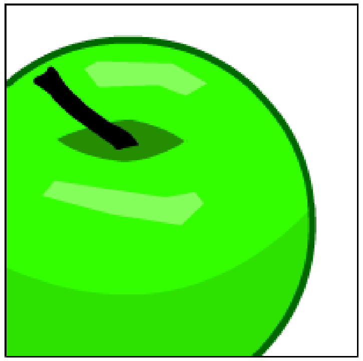
CORRELATED SUBQUERY DELETE



The example below deletes rows of all employees who work for a manager that manages more than 2 departments.

```
DELETE FROM employees e
WHERE  e.manager_id =
          (SELECT d.manager_id
           FROM    departments d
           WHERE  e.department_id = d.department_id
           HAVING  count (d.department_id) > 2
           GROUP BY d.manager_id);
```

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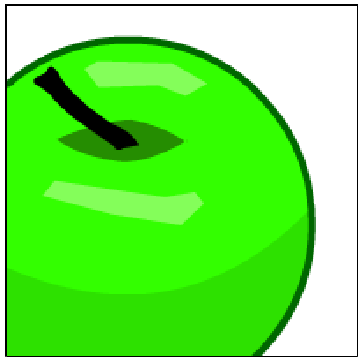
INTEGRITY CONSTRAINT ERRORS



Integrity constraints ensure that the data conforms to a needed set of rules. The constraints are automatically checked whenever a DML statement which could break the rules is executed. If the any rule would be broken, the table is not updated and an error is returned.

This example violates a NOT NULL constraint, because first_name has a not null constraint and id=123 does not exist, so the subquery returns a null result.

```
UPDATE copy_f_staffs
SET first_name =  (SELECT first_name
                   FROM copy_f_staffs
                   WHERE id = 123);
```

```
ORA-01407:  cannot update
(“USQA_JOHN_SQL01_S01”.“COPY_F_STAFFS”.“FIRST_NAME”) to NULL
```

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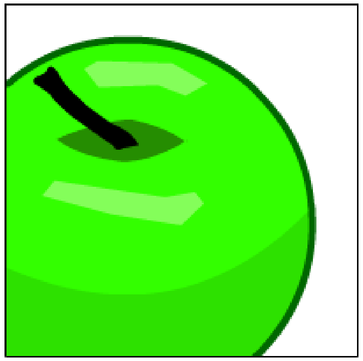
INTEGRITY CONSTRAINT ERRORS



When will primary key - foreign key constraints be checked?

The EMPLOYEES table has a foreign key constraint on department_id, which references the department_id of the DEPARTMENTS table. This ensures that every employee belongs to a valid department.

In the DEPARTMENTS table, department_ids 10 and 20 exist but 15 does not.

Which of the following statements will return an error?

```
1. UPDATE employees SET department_id = 15
   WHERE employee_id = 100;

2. DELETE FROM departments WHERE department_id = 10;

3. UPDATE employees SET department_id = 10
   WHERE     department_id = 20;
```

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INTEGRITY CONSTRAINT ERRORS

When modifying your copy tables (for example copy_f_customers) you may see not null constraint errors, but you will not see any primary key – foreign key constraint errors.

This is because the CREATE TABLE …. AS (SELECT …) statement used to create the copy tables copies the rows to the copy table and copies the not null constraints, but does **not** copy primary key – foreign key constraints.

Therefore at present there are no primary key – foreign key constraints on the copy tables.

Later in the course you will learn how to add these constraints.

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Terminology

Key terms used in this lesson include:

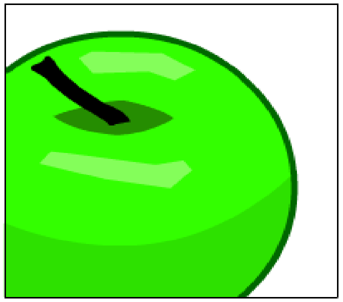
DELETE

Integrity constraint

UPDATE

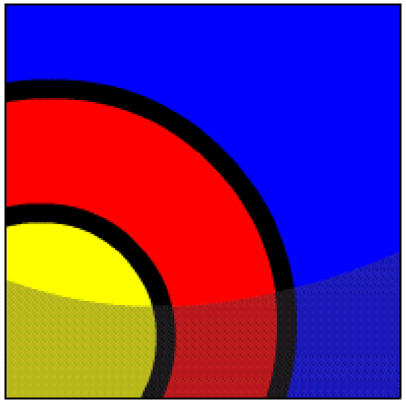
Correlated subquery UPDATE

Correlated subquery DELETE



Summary

In this lesson you have learned to:



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Summary

Practice Guide

The link for the lesson practice guide can be found in the course resources in Section 0.