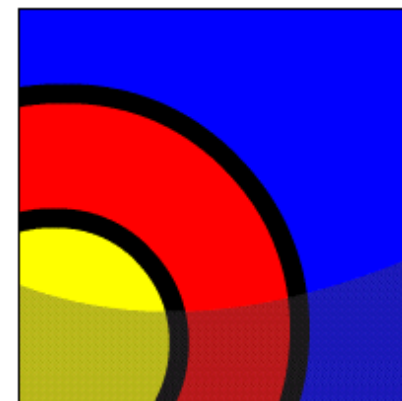# Review of SQL DML

What Will I Learn?

In this lesson, you will review how to construct and execute a DML statement to:
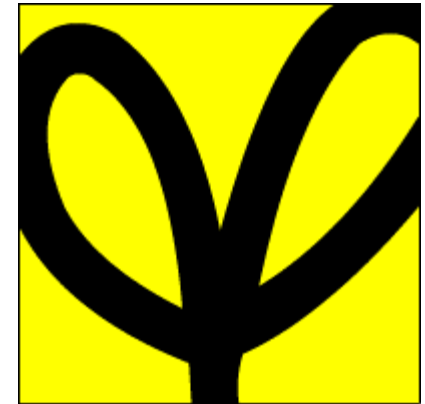
- Insert data into a database table
- Update data in a database table
- Delete data from a database table
- Merge data into a database table

Why Learn It?

When you create, change, or delete an object in a database, it is called data definition language (DDL). When you change data in an object (for example, by inserting or deleting rows), it is called data manipulation language (DML).
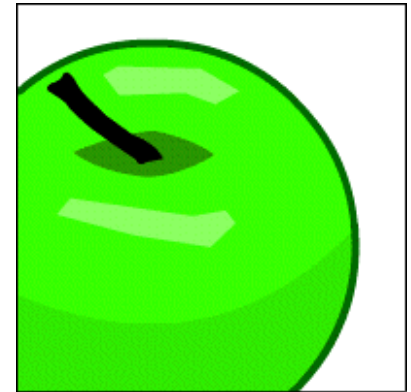
This lesson reviews basic SQL DML statements. Later, you will use DML statements in your PL/SQL code to modify data.

Tell Me/Show Me

Data Manipulation Language (DML)

- You can use DML commands to modify the data in a database table.

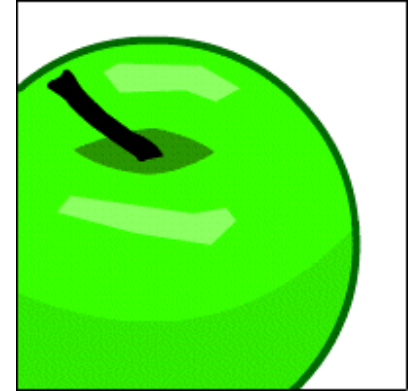- The DML commands are `INSERT`, `UPDATE`, `DELETE`, and `MERGE`.

Tell Me/Show Me

`INSERT`

You use the `INSERT` statement to add new rows to a table. Three items are included in the statement:

- The name of the table
- The names of the columns in the table to populate
- Values for the columns

Tell Me/Show Me

`INSERT` **(continued)**

The syntax shown explicitly lists each column as it appears in the table. The values for each column must be listed in the same order.

```
INSERT INTO art (id, title, artist, description)
   VALUES (35, 'Mona Lisa', 'Leonardo da Vinci', 'oil
   painting');
```

ID	TITLE	ARTIST	DESCRIPTION
20	Skriget	Edvard Munch	oil painting
10	Guernica	Pablo Picasso	oil painting
30	Femmes de Tahiti (Sur la plage)	Edvard Munch	oil painting

Tell Me/Show Me

INSERT (continued)

Another way to insert values in a table is to implicitly add them by omitting the column names.

The values for each column must match the default order in which they appear in the table, and a value must be provided for each column.

```
INSERT INTO art
  VALUES (40, 'Stained Glass window at the United Nations
Building, New York', 'Marc Chagall', 'oil painting');
```

ID	TITLE	ARTIST	DESCRIPTION
20	Skriget	Edvard Munch	oil painting
10	Guernica	Pablo Picasso	oil painting
30	Femmes de Tahiti (Sur la plage)	Paul Gauguin	oil painting
35	Mona Lisa	Leonardo da Vinci	oil painting

Tell Me/Show Me

UPDATE

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

- The name of the table
- The name of the column in the table to modify
- A corresponding value or subquery for the column
- (Optionally) a condition that identifies the rows to be modified by the statement

```
UPDATE art
   SET description = 'Stained Glass Window'
   WHERE id = 40;
```

ID	TITLE	ARTIST	DESCRIPTION
10	Guerrica	Pablo Picasso	oil painting
20	Skriget	Edvard Munch	oil painting
30	Femmes de Tahiti (Sur la plage)	Paul Gauguin	oil painting
35	Mona Lisa	Leonardo da Vinci	oil painting
40	Stained Glass window at the United Nations Building, New York	Leonardo da Vinci	oil painting

Stained…

Tell Me/Show Me

DELETE

You use the DELETE statement to remove existing rows in a table. The statement requires at least one value:

- The name of the table
- (Optionally) the condition that identifies the rows to be deleted

In the example shown, the highlighted row is deleted.

ID	TITLE	ARTIST	DESCRIPTION
10	Guernica	Pablo Picasso	oil painting
20	Skriget	Edvard Munch	oil painting
30	Femmes de Tahiti (Sur la plage)	Paul Gauguin	oil painting
35	Mona Lisa	Leonardo da Vinci	oil painting
40	Stained Glass window at the United Nations Building, New York	Marc Chagall	Stained Glass Window

```
DELETE FROM art
   WHERE id = 10;
```

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Tell Me/Show Me

MERGE

The `MERGE` statement will `INSERT` and/or `UPDATE` a target table, based on matching values in a source table. If a matching value is missing, a new row is inserted. If a matching value exists, but needs to be changed, then `MERGE` updates it.

Merge the data from the ITEMS table into:

ITEM_ID	TITLE	ARTIST	DESCRIPTION
1	Madonna	Edward Munch	oil painting
3	Femmes de Tahiti (Sur la plage)	Paul Gauguin	oil painting
4	Stained Glass window at the United Nations Building, New York	Paul Gauguin	oil painting
35	Mona Lisa	Leonardo da Vinci	Small Oil Painting on Wood

The ART table

ITEM_ID	TITLE	ARTIST	DESCRIPTION
20	Skriget	Edward Munch	oil painting
30	Femmes de Tahiti (Sur la plage)	Paul Gauguin	oil painting
35	Mona Lisa	Leonardo da Vinci	oil painting
40	Stained Glass window at the United Nations Building, New York	Marc Chagall	Stained Glass Window

Tell Me/Show Me

MERGE (continued)

The statement shown uses ITEMS (alias i) as the source table to merge and update information into ART (alias a), the target table.

```
MERGE INTO art a
  USING items i
    ON (a.id = i.item_id)
  WHEN MATCHED
  THEN UPDATE SET
    a.artist      = i.artist,
    a.description = i.description
  WHEN NOT MATCHED
  THEN INSERT
    VALUES(i.item_id, i.title, i.artist, i.description);
```

The ART table after the MERGE

ID	TITLE	ARTIST	DESCRIPTION
1	Madonna	Edvard Munch	oil painting
3	Femmes de Tahiti (Sur la plage)	Paul Gauguin	oil painting
4	Stained Glass window at the United Nations Building, New York	Marc Chagall	Stained Glass Window
20	Skriget	Edvard Munch	oil painting
30	Femmes de Tahiti (Sur la plage)	Paul Gauguin	oil painting
35	Mona Lisa	Leonardo de Vinci	Small oil painting on Wood
40	Stained Glass window at the United Nations Building, New York	Marc Chagall	Stained Glass Window

Tell Me/Show Me

Terminology

Key terms used in this lesson include:
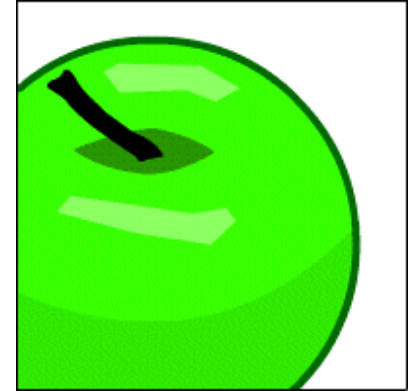
Data Manipulation Language (DML)

Data Definition Language (DDL)

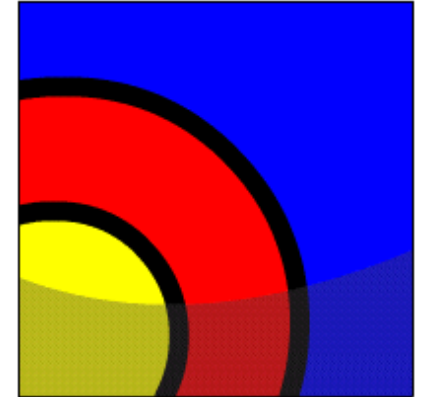INSERT

UPDATE

DELETE

MERGE

⊚ **Summary**

In this lesson, you reviewed how to construct
and execute a DML statement to:

- Insert data into a database table
- Update data in a database table
- Delete data from a database table
- Merge data into a database table

Try It/Solve It

The exercises in this lesson cover constructing and executing DML statements to modify data using the following syntax:

- `INSERT`
- `UPDATE`
- `DELETE`
- `MERGE`