

Oracle Academy

Database Programming with SQL

Instructor Resource Guide

Notes For PowerPoint Slides:

SECTION 7 LESSON 1 – INSERT Statement

Slide 1: INSERT Statement

Lesson Preparation

This section begins the SQL syntax commonly referred to as data manipulation language (DML).

Students will try to insert values into a table without checking the data types, maximum size or null value requirements. Encourage them to use DESCRIBE tablename on each table before attempting to perform DML on it. Even though data may appear to be a number value in a row, the DESCRIBE may show that the data type is CHAR or VARCHAR2 and therefore require single quotation marks in the DML statements. This may eliminate problems that students can encounter, such as “it doesn't run!”

What to Watch For

Discourage frivolous data! Use student names to generate interest.

Slide 2: What Will I Learn?

No instructor notes for this slide

Slide 3: Why Learn It?

No instructor notes for this slide

Slide 4: Tell Me / Show Me – You will be responsible for altering tables in ...

No instructor notes for this slide

Slide 5: Tell Me / Show Me – Use this syntax to create a copy of a table:

There are 12 tables in the DJs on Demand scenario, and 9 in the Global Fast Foods scenario. Students do not have to copy them all now!

Slide 6: Tell Me / Show Me – DML statements enable users to make ...

No instructor notes for this slide

Slide 7: Tell Me / Show Me – The syntax shown uses INSERT to add...

Point out that the list of column names does not have to be in the same order as the columns are listed in a DESCRIBE. The column names can be listed in any order (although there is no benefit in doing this) as long as the column values are listed in the same order as the column names.

Slide 8: Tell Me / Show Me – Another way to insert values in a table...

No instructor notes for this slide

Slide 9: Tell Me / Show Me – The INSERT statement in this example...

Not only for clarity! In a later lesson, students will learn how to add a new column to a table. Ask them what would happen if Global Fast Foods later decided they wanted to keep track of customers' e-mail addresses, in order to send them mailshots of new and changed menus. The DBA would add an extra e-mail column to the table. From then on, the INSERT statement above would fail because it is trying to insert 8 values into every one of 9 columns.

Slide 10: Tell Me / Show Me – CHECK THE TABLE FIRST

No instructor notes for this slide

Slide 11: Tell Me / Show Me – As shown in the example, the table...

No instructor notes for this slide

Slide 12: Tell Me / Show Me – Notice the Length column for ...

Ask students: what is the maximum allowed length of a FIRST_NAME? Answer: 25 characters.

Note that a column of data type Date always has length = 7. However, we can and do still use values such as '25-SEP-88' (which is 9 characters) for dates.

Slide 13: Tell Me / Show Me – INSERTING ROWS WITH NULL VALUES

The INSERT statement need not specify every column, as long...

Ask students: what is the maximum allowed length of a FIRST_NAME? Answer: 25 characters.

Note that a column of data type Date always has length = 7. However, we can and do still use values such as '25-SEP-88' (which is 9 characters) for dates.

Slide 14: Tell Me / Show Me – INSERTING ROW WITH NULL VALUES

If a column can hold null values, it can ...

Point out that the statement inserts an explicit null into OVERTIME_RATE and an implicit null into TRAINING.

Slide 15: Tell Me / Show Me – INSERTING SPECIAL VALUES

Special values such as SYSDATE and USER can ...

Point out that this employee was inserted on 12th March 2006.

Slide 16: Tell Me / Show Me – INSERTING SPECIAL VALUES

In addition, functions and calculated expressions...

No instructor notes for this slide

Slide 17: Tell Me / Show Me – INSERTING SPECIFIC DATE VALUES

No instructor notes for this slide

Slide 18: Tell Me / Show Me – Similarly, if we want to INSERT...

No instructor notes for this slide

Slide 19: Tell Me / Show Me – A second example of TO_DATE ...
No instructor notes for this slide

Slide 20: Tell Me / Show Me – USING A SUBQUERY TO COPY ROWS
Each INSERT statement we have seen so far...
No instructor notes for this slide

Slide 21: Tell Me / Show Me – USING A SUBQUERY TO COPY ROWS
In the example shown, a new table ...
No instructor notes for this slide

Slide 22: Tell Me / Show Me – USING A SUBQUERY TO COPY ROWS
If we want to copy all the data – all rows and ...
No instructor notes for this slide

Slide 23: Tell Me / Show Me - Terminology
USER-Someone doing "real work" with the computer, using it as a means rather than an end
Transaction-Consists of a collection of DML statements that form a logical unit of work.
Explicit-Fully and clearly expressed; leaving nothing implied
INSERT INTO-Adds a new row to a table

Slide 24: Summary – In this lesson you have learned to:
No instructor notes for this slide

Slide 25: Summary - Practice Guide
No instructor notes for this slide

SECTION 7 LESSON 2 – Updating Column Values and Deleting Rows

Slide 1: Updating Column Values and Deleting Rows

Lesson Preparation

Any time you have extra time in class, have students work on the self-test software questions in the section called "Manipulating Data."

Slide 2: What Will I Learn?

No instructor notes for this slide

Slide 3: Why Learn It?

Encourage students to "think like a professional." This will help curb problems with students making incorrect changes to their tables and depending on you to help restore them. Also, remind them to use only their copy_tablename tables in all DML transactions.

Slide 4: Tell Me / Show Me – UPDATE

The UPDATE statement is used to modify existing rows...

No instructor notes for this slide

Slide 5: Tell Me / Show Me – UPDATE

This example shown uses an UPDATE statement ...

Encourage students to "think like a professional." This will help curb problems with students making incorrect changes to their tables and depending on you to help restore them. Also, remind them to use only their copy_tablename tables in all DML transactions.

Slide 6: Tell Me / Show Me – UPDATE

We can change several columns and/or several rows...

Point out that the two updated columns must be separated by a comma – most students will probably assume this anyway, since almost every "list" of two or more things is comma-separated in SQL.

Slide 7: Tell Me / Show Me – UPDATE

Which rows would be updated in the following...

Answer: all the rows in the table will be updated.

Slide 8: Tell Me / Show Me – UPDATE

Updating a Column with a value from a Subquery

No instructor notes for this slide

Slide 9: Tell Me / Show Me – Updating Two Columns with Two Subquery Statements

Point out that the two subqueries do not have to select the same row (id=9) or even the same table.

Slide 10: Tell Me / Show Me – UPDATING ROWS BASED ON ANOTHER TABLE

No instructor notes for this slide

Slide 11: Tell Me / Show Me – DELETE

No instructor notes for this slide

Slide 12: Tell Me / Show Me – DELETE

The example shown uses the Global Fast Foods database

No instructor notes for this slide

Slide 13: Tell Me / Show Me – SUBQUERY DELETE

Point out at this stage that it is perfectly valid for a DELETE or UPDATE statement not to affect any rows. This is not an error. For example:

```
DELETE FROM employees
WHERE department_id =
      (SELECT department_id
       FROM departments
       WHERE department_name = 'Purchasing');
```

The Purchasing department does not exist, therefore the subquery returns no results and no employees are deleted.

Slide 14: Tell Me / Show Me – Deleting Rows Based On Another Table

The EMP and LOCATIONS table do not exist in our database.

Slide 15 Tell Me / Show Me INTEGRITY CONSTRAINT ERRORS

Integrity constraints ensure that the data conforms to a ...

No instructor notes for this slide

Slide 16: Tell Me / Show Me INTEGRITY CONSTRAINT ERRORS

When will primary key – foreign key constraints be checked?

Answers:

1. will return an error because department_id 15 does not exist (and employee_id 100 does exist)

2. will return an error unless there are no employees in department_id 10

3. will succeed.

Point out the four possibilities for violating a foreign key constraint:

- deleting a row from the primary key table
- inserting a row into the foreign key table
- updating the primary key column in the primary key table
- updating the foreign key column in the foreign key table.

Slide 17: Tell Me / Show Me INTEGRITY CONSTRAINT ERRORS

When modifying your copy tables ...

No instructor notes for this slide

Slide 18: Tell Me /Show Me - Terminology

Update-Modifies existing rows in a table

Integrity constraint-Ensures that the data adheres to a predefined set of rules

Delete-Removes existing rows from a table

Slide 19: Summary – In this lesson you have learned to:

No instructor notes for this slide

Slide 20: Summary - Practice Guide

No instructor notes for this slide

SECTION 7 LESSON 3 – DEFAULT Values and the MERGE Statement

Slide 1: DEFAULT Values and the MERGE Statement

What to Watch For

The MERGE statement is challenging for students. Students will understand the concept of UPDATE or INSERT but the syntax structure is difficult. Break the statement into a description that has to tell what and where, a join, and an INSERT statement.

MERGE INTO what table USING what table/view/subquery

ON what join condition

WHEN MATCHED THEN UPDATE SET

col1 = col2 value....

WHEN NOT MATCHED THEN

INSERT(column_list)

VALUES(column_values)

Slide 2: What Will I Learn?

No instructor notes for this slide

Slide 3: Why Learn It?

A data warehouse is a collection of data designed to support business-management decision making. Data warehouses contain a wide variety of data, such as sales data, customer data, payroll, accounting, and personnel data, that presents a coherent picture of business conditions at a single point in time.

Slide 4: Why Learn It? (continued)

A data warehouse is a collection of data designed to support business-management decision making. Data warehouses contain a wide variety of data, such as sales data, customer data, payroll, accounting, and personnel data, that presents a coherent picture of business conditions at a single point in time. Typically, a data warehouse is housed on an enterprise mainframe server.

Slide 5: Tell Me / Show Me – DEFAULT

The DESCRIBE command will display column attributes that indicate a default value if one has been specified.

Slide 6: Tell Me / Show Me – The example below shows a default...

Students have not studied CREATE TABLE yet, but this simple example should be clear enough. The effect here of using DEFAULT is that any employee who is inserted without an explicit value for hire_date is assumed to be hired on the same date that we insert his/her row into the table.

Slide 7: Tell Me / Show Me – Explicit DEFAULT with INSERT The point here is that the default value of a column can be changed, as students will discover later in the course. Using DEFAULT in the VALUES list ensures that every new row uses the current default value.

Slide 8: Tell Me / Show Me – Explicit DEFAULT with UPDATE

No instructor notes for this slide

Slide 9: Tell Me / Show Me – MERGE

Students will learn about privileges later in the course. For now, as owners of the tables in their schema they automatically have all privileges on those tables.

Slide 10: Tell Me / Show Me – MERGE SYNTAX

No instructor notes for this slide

Slide 11: Tell Me / Show Me – This example uses the EMPLOYEES ...

No instructor notes for this slide

Slide 12: Tell Me / Show Me – MERGE INTO

Students may ask: do we really need MERGE? Why not use two separate statements – one INSERT and one UPDATE ?

The reason for using MERGE is that it saves time with very large source tables. This is very common when loading data into large data warehouses. For example, suppose EMPLOYEES contained 100 million rows. Reading and processing all those rows would take a long time – let's say 2 hours. If we use separate INSERT and UPDATE statements, all those rows must be read twice: $2 + 2 = 4$ hours. But using a single MERGE statement, the rows need be read only once: 2 hours.

Slide 13: Summary – In this lesson you have learned to:

No instructor notes for this slide

Slide 14: Summary - Practice Guide

No instructor notes for this slide

Notes For Practice Activities:

INSERT Statement S07 L01

Vocabulary

<u>USER</u>	Someone doing "real work" with the computer, using it as a means rather than an end
<u>Transaction</u>	Consists of a collection of DML statements that form a logical unit of work.
<u>Explicit</u>	Fully and clearly expressed; leaving nothing implied
<u>INSERT INTO</u>	Adds a new row to a table

Try It / Solve It

Students should execute DESC tablename before doing INSERT to view the data types for each column. VARCHAR2 data-type entries need single quotation marks in the VALUES statement.

1. Examples may vary.

2. Students will enter the four new rows to the copy_d_cds table using an explicit INSERT statement.

```
INSERT INTO copy_d_cds(cd_number, title, producer, year)
VALUES (97, 'Celebrate The Day', 'R&B Inc.', 2003);
To verify the entry, SELECT* FROM copy_d_cds;
```

3. INSERT INTO copy_d_songs VALUES(52, 'Surfing Summer', null, null, 12);

4. INSERT INTO copy_d_clients VALUES(6655, 'Ayako', 'Dahish', 3608859030, 'dahisha@harbor.net');

5. The COST column is mandatory, but the cost is not known at the time of insert. Zero (0) will have to be inserted as the default cost.

```
INSERT INTO copy_d_events (ID, NAME, EVENT_DATE, DESCRIPTION, COST,
VALUE_ID, PACKAGE_CODE, THEME_CODE, CLIENT_NUMBER)
VALUES(110, 'Ayako Anniversary', TO_DATE('07-JUL-04','DD-MON-RR'), 'Party
for 50, sixties dress, decorations', NULL, 0, 245,79,240,6655);
```

6. Students should execute DESC tablename before doing INSERT to view the data types for each column. VARCHAR2 data-type entries need single quotation marks in the VALUES statement.

```
INSERT INTO rep_email (id, first_name, last_name, email_address)
SELECT id, first_name, last_name, email
FROM employees
WHERE UPPER(job_id) LIKE '%REP%';
```

Updating Column Values and Deleting Rows S07 L02

Vocabulary

<u>UPDATE</u>	Modifies existing rows in a table
<u>Integrity Constraint</u>	Ensures that the data adheres to a predefined set of rules
<u>Delete</u>	Removes existing rows from a table

Try It / Solve It

```
1. UPDATE copy_f_food_items
SET price = 3.75
WHERE description = 'Strawberry Shake';
UPDATE copy_f_food_items
SET price = 1.20
WHERE description = 'Fries';

2. UPDATE copy_f_staffs
SET overtime_rate = NVL(overtime_rate,0) + .75
WHERE id =
(SELECT id
FROM copy_f_staffs
WHERE first_name = 'Bob' and last_name = 'Miller');
or
UPDATE copy_f_staffs
SET overtime_rate = NVL(overtime_rate,0) + 0.75
WHERE last_name = 'Miller'
AND first_name = 'Bob';

UPDATE copy_f_staffs
SET overtime_rate = overtime_rate + .85
WHERE id =
(SELECT id
FROM copy_f_staffs
WHERE first_name = 'Sue' and last_name = 'Doe');

UPDATE copy_f_staffs
SET overtime_rate = overtime_rate + .85
WHERE last_name = 'Doe'
AND first_name = 'Sue';
```

4. INSERT INTO copy_f_customers(id, first_name, last_name, address, city, state, zip, phone_number)
VALUES (145, 'Katie', 'Hernandez', '92 Chico Way', 'Los Angeles', 'CA', 98008, 8586667641) ;
INSERT INTO copy_f_customers(id, first_name, last_name, address, city, state, zip, phone_number)
VALUES (225, 'Daniel', 'Spode', '1923 Silverado Street', 'Denver', 'CO', 98107, 4258879009) ;
You cannot insert the Adam Zum because the zip cannot be null.

5. UPDATE copy_f_staffs
SET salary =
(SELECT salary
FROM copy_f_staffs
WHERE first_name = 'Bob' and last_name = 'Miller')
WHERE first_name = 'Sue' and last_name ='Doe';

6. INSERT INTO copy_f_staffs(id, first_name, last_name, birthdate, salary, overtime_rate, training, staff_type, manager_id, manager_budget, manager_target)
VALUES (25, 'Kai', 'Kim', '03-NOV-88', 6.75, null, null, 'Order Taker', null, null, null)

7. UPDATE copy_f_staffs
SET manager_id =
(SELECT manager_id
FROM copy_f_staffs
WHERE first_name = 'Sue' AND last_name = 'Doe')
WHERE ID = 25;

8. Department 60 cannot be deleted because it contains a primary key that is used as a foreign key in another table. Explain: This is a violation of an integrity constraint.

9. DELETE from copy_f_staffs
WHERE ID = 25;
OR
DELETE FROM copy_f_staffs
WHERE last_name = 'Kai'
AND first_name = 'Kim'
SELECT *
FROM copy_f_staffs;

DEFAULT Values and the MERGE Statement S07 L03

Try It / Solve It

1. Prevents a null value being inserted if a row is inserted without a specified value for a column.

```
2c. INSERT INTO copy_f_promotional_menus (code, name, start_date, end_date,
give_away)
VALUES( 120, 'New Customer', DEFAULT, '01-JUN-05', '10% discount coupon');
```

```
3b. CREATE TABLE manager_copy_d_cds
AS (SELECT * FROM d_cds) ;
```

```
3c. INSERT INTO copy_d_cds (cd_number, title, producer, year)
VALUES( 120, 'Hello World Here I Am', 'Middle Earth Records', '1998');
```

```
3d. MERGE INTO manager_copy_d_cds c USING d_cds d
ON (c.cd_number = d.cd_number)
WHEN MATCHED THEN UPDATE
SET
c.year = d.year,
c.title = d.title,
c.producer = d.producer
WHEN NOT MATCHED THEN INSERT
VALUES (d.cd_number, d.title, d.producer, d.year);
```