DBMS SQL

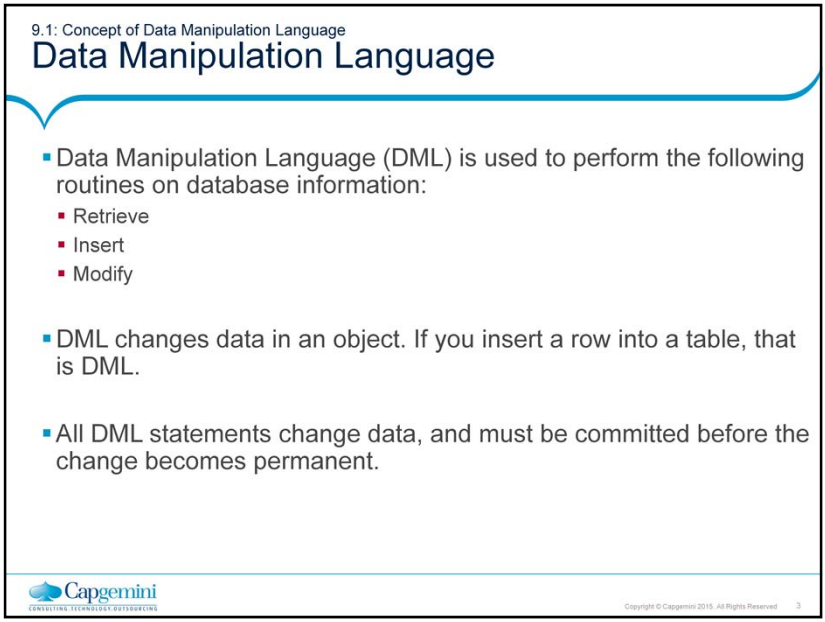
Lesson 10: Data Manipulation Language

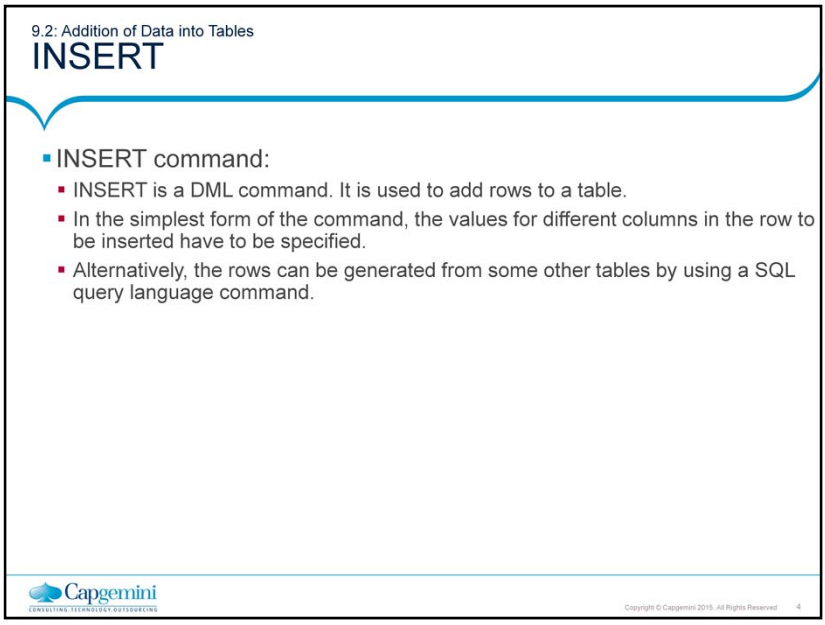
Lesson Objectives

- To understand the following topics:
  - Concept of Data Manipulation Language
  - Inserting rows into a table
  - Deleting rows from a table
  - Updating rows in a table

Capgemini
CONSULTING. TECHNOLOGY. OUTSOURCING

 2

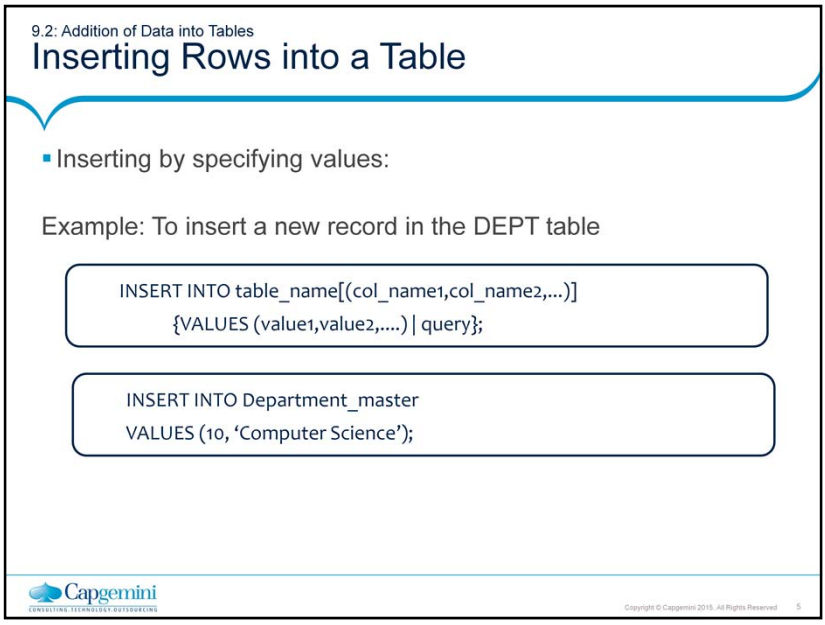

9.1: Concept of Data Manipulation Language
Data Manipulation Language
Data Manipulation Language (DML) is used to perform the following routines on database information:
Retrieve
Insert
Modify
DML changes data in an object. If you insert a row into a table, that is DML.
All DML statements change data, and must be committed before the change becomes permanent.
Capgemini
CONSULTING. TECHNOLOGY. OUTSOURCING
Copyright © Capgemini 2015. All Rights Reserved. 3



Addition of Data into Tables:

Requisites for using INSERT command:

- If values are specified for all columns in the order specified at creation, then col_names could be omitted.
- Values should match “data type” of the respective columns.
- Number of values should match the number of column names mentioned.
- All columns declared as NOT NULL should be supplied with a value.
- Character strings should be enclosed in quotes.
- Date values should be enclosed in quotes.
- Values will insert one row at a time.
- Query will insert all the rows returned by the query.
- The table_name can be a “table” or a “view”. If table_name is a “view”, then the following restrictions apply:
    1. The “view” cannot have a GROUP BY, CONNECT BY, START WITH, DISTINCT, UNION, INTERSECT, or MINUS clause or a join.
    2. If the “view” has WITH CHECK OPTION clause, then a row, which will not be returned by the view, cannot be inserted.



Inserting Rows into a Table:

Example:

- Inserting a row in EMP table giving all values.

```
INSERT INTO student_master

VALUES(1001,'Amit',10,'11-Jan-80','Chennai');
```

  - 10 is a dept number which exists in DEPARTMENT_MASTER table

- Inserting a row in STAFF_MASTER table giving some values.

```
INSERT INTO staff_master
(staff_code,staff_name,design_code,dept_code)

VALUES(100001,'Arvind',102,30);
```

  - This row will be created if all the constraints like NOT NULL are satisfied.

Inserting Rows into a Table

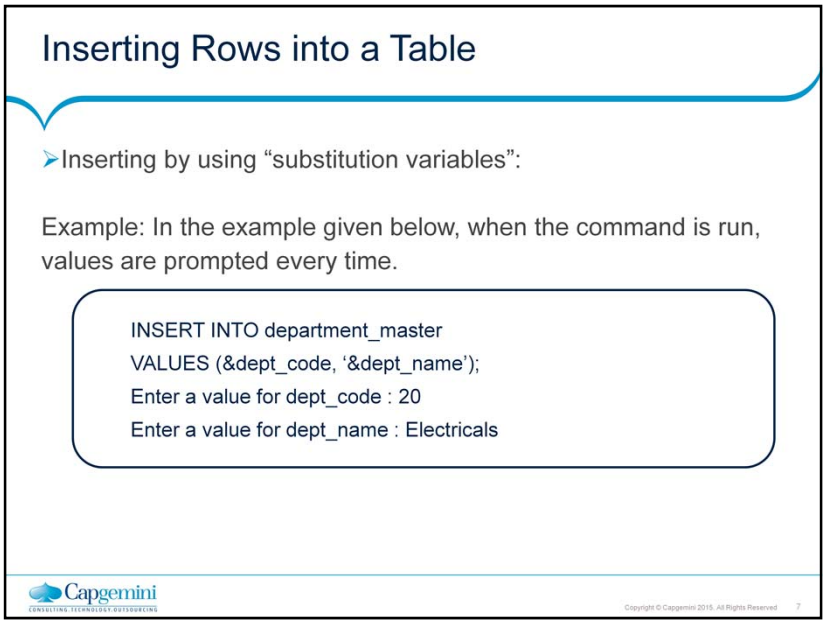
- Inserting rows in a table from another table using Subquery:

Example: The example given below assumes that a new_emp_table exists. You can use a subquery to insert rows from another table.

```
INSERT INTO new_staff_table
SELECT * FROM staff_master
WHERE staff_master.hiredate > '01-jan-82';
```

Capgemini
CONSULTING. TECHNOLOGY. OUTSOURCING

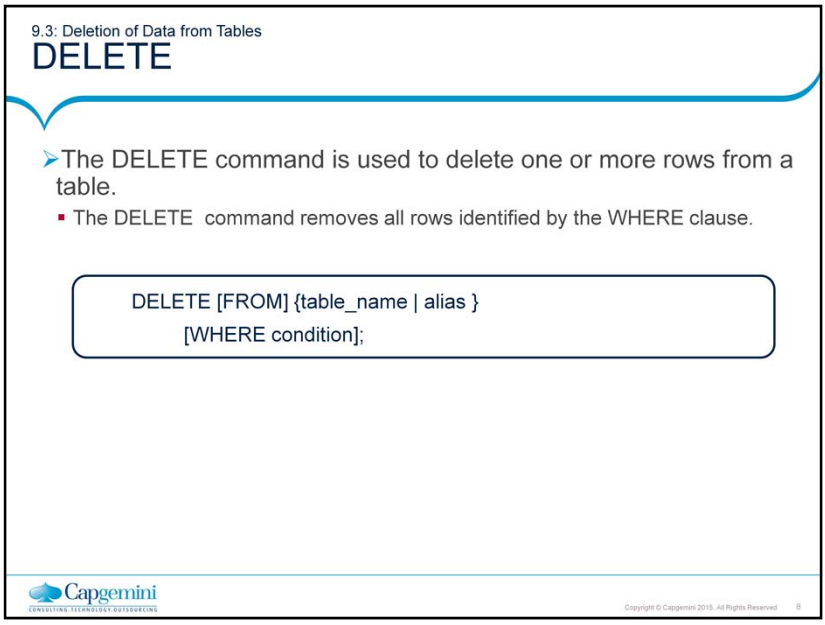
 6



Inserting Rows into a Table:

Inserting by using “substitution variables”:

- The problem with the INSERT statement is that it adds only “one row” to the table.
- However, by using “substitution variables” the speed of data input can be increased.
- Whenever a “substitution variable” is placed in a “value” field, the user will be prompted to enter the “actual value” when the command is executed.



Deletion of Data from Tables

- The table_name can be a “table” or a “view”.
- The DELETE command is used to delete one or more rows from a table.
- The DELETE statement removes all rows identified by the WHERE clause.
  - This is another DML, which means we can rollback the deleted data, and that to make our changes permanent.
- If WHERE clause is omitted, all rows from the table are removed. Else all rows which satisfy the condition are removed.
- FROM clause can be omitted without affecting the statement.

Deleting Rows from Table

Example 1: If the WHERE clause is omitted, all rows will be deleted from the table.

Example 2: If we want to delete all information about department 10 from the Emp table:

```
DELETE FROM staff_master;
```

```
DELETE FROM student_master WHERE  dept_code=10;
```

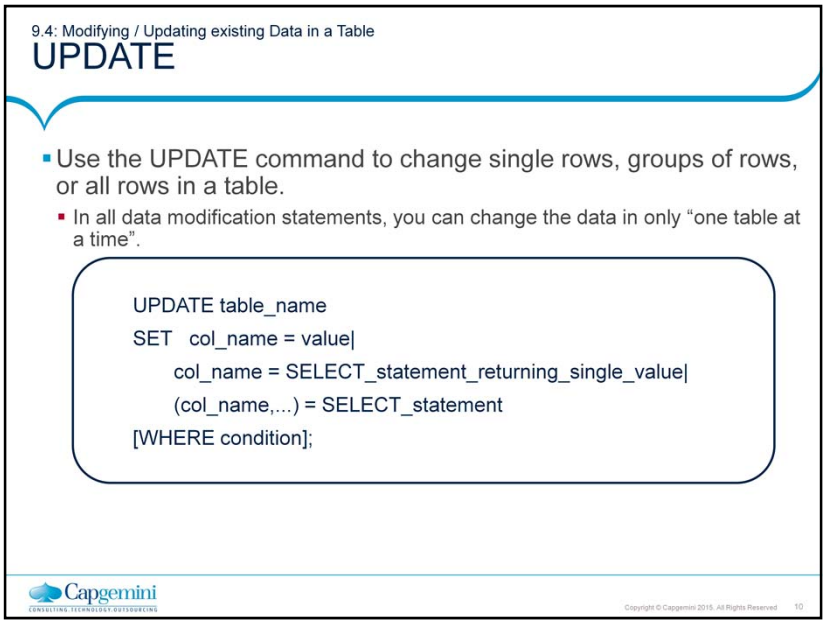
Capgemini
CONSULTING. TECHNOLOGY. OUTSOURCING

 9

Deletion of Data from Tables

Example 3:

```
DELETE staff_master WHERE staff_name = 'Anil';
```



Modifying / Updating existing Data in a Table:

- The table_name can be a "table" or a "view".
- The "value" can be a value, an expression, or a query, which returns a single value.
- The UPDATE command provides automatic navigation to the data.
- **Note:** If the WHERE clause is omitted, all rows in the table will be updated by a value that is currently specified for the field. Else only those rows which satisfy the condition will be updated.

Updating Rows from Table

Example 1: To UPDATE the column “dname” of a row, where deptno is 10, give the following command:

```
UPDATE department_master
SET dept_name= ‘Information Technology’
WHERE dept_code=10;
```

Updating Rows from Table

Example 2: To UPDATE the subject marks details of a particular student, give the following command:

```
UPDATE student_marks
SET subject1= 80 , subject2= 70
        WHERE student_code=1005;
```

Capgemini
CONSULTING. TECHNOLOGY. OUTSOURCING

 12

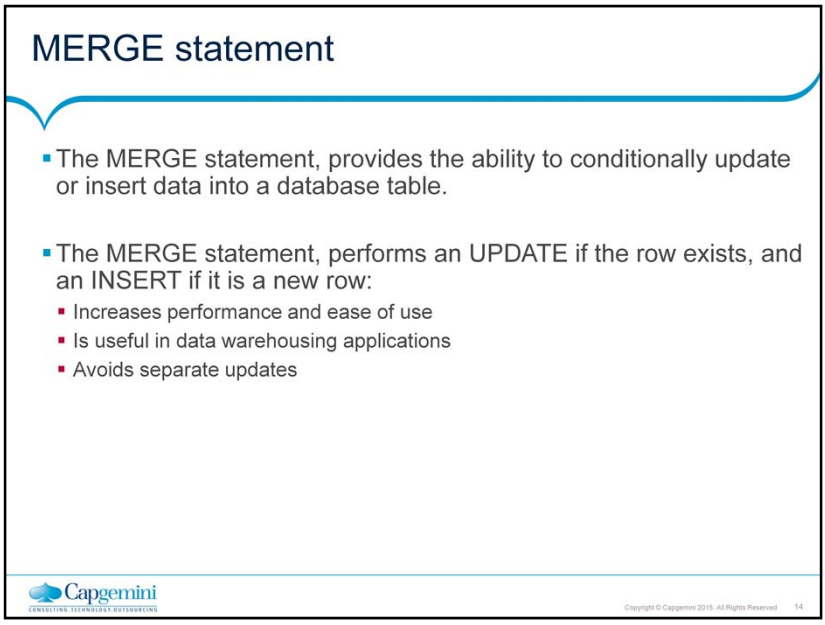
Using a Subquery to do an Update

- For making salary of “Anil” equal to that of staff member 100006, use the following command:

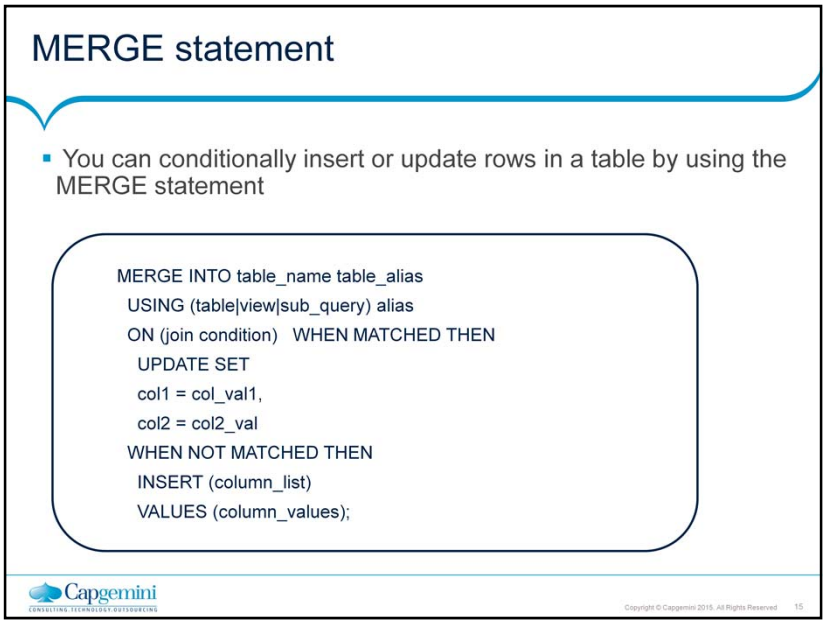
```
UPDATE staff_master
SET staff_sal = (SELECT staff_sal FROM staff_master
                        WHERE staff_code = 100006 )
WHERE staff_name = ‘Anil';
```

Capgemini
CONSULTING. TECHNOLOGY. OUTSOURCING

 13



MERGE Statement
The MERGE statement is used mostly in data warehouse environments to build the data in warehouse



- **INTO :** this is how we specify the target for the MERGE. The target must be either a table or an updateable view (an in-line view cannot be used here);
- **USING :** the USING clause represents the source dataset for the MERGE. This can be a single table (as in our example) or an in-line view;
- **ON () :** the ON clause is where we supply the join between the source dataset and target table. Note that the join conditions must be in parentheses;
- **WHEN MATCHED:** this clause is where we instruct Oracle on what to do when we already have a matching record in the target table (i.e. there is a join between the source and target datasets). We obviously want an UPDATE in this case. One of the restrictions of this clause is that we cannot update any of the columns used in the ON clause (though of course we don't need to as they already match). Any attempt to include a join column will raise an unintuitive invalid identifier exception; and
- **WHEN NOT MATCHED :** this clause is where we INSERT records for which there is no current match.
- Note that sqlplus reports the number of rows **merged**. This includes both the updates and inserts. Oracle treats MERGE as a MERGE and not an UPDATE+INSERT statement. The same is true of SQL%ROWCOUNT in PL/SQL.

Example on Merge

Example

```
CREATE table staff_copy as select staff_code,staff_name FROM
staff_master where 1=2;

MERGE into staff_copy using staff_master
   ON (staff_master.deptno=staff_copy.deptno)
   WHEN MATCHED THEN
   UPDATE SET staff_code=staff_master.staff_code,
   staff_name=staff_master.staff_name
   WHEN NOT MATCHED THEN
  INSERT (staff_code,staff_name) values
 (staff_master.staff_code,staff_master.staff_name);
```

Capgemini
CONSULTING. TECHNOLOGY. OUTSOURCING

 16

Summary

- The concept of Data Manipulation Language
- Inserting rows into a table
- Deleting rows from a table
- Updating rows in a table
- Using Merge Statement

Capgemini
CONSULTING. TECHNOLOGY. OUTSOURCING

Review - Questions

- Question 1: Both TRUNCATE statement and DELETE without condition removes the entire date from a table
  - True/False
- Question 2: All DML statements are auto committed
  - True/False
- Question 3:In a transaction, DDL statement after DML statement commits the changes done by DML.
  - True/False

Capgemini
CONSULTING. TECHNOLOGY. OUTSOURCING

Review - Questions

- Question 4: Inserting rows in a table emp1 from another table can be done using ___.
  - Option 1: insert into emp1(t1) as select empno from emp
  - Option 2: insert into emp1(t1) select empno from emp
  - Option 3: insert into emp1(t1) as select * from emp