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Database Programming with SQL 2 / 2

JUAN CARLOS HERRERA HERNANDEZ
UNIVERSIDAD POLITECNICA DE AGUASCALIENTES

Contenido

Section 11 – Ensuring Quality Queries Part I

11-1 Ensuring Quality Query Results

Solve a series of problems:

- Solve a series of problems Create a query to produce specified data
- Modify a query to produce specified data

Select * from user_tables	PURGE RECYCLEBIN;
select * from tab;	

Section 12 – DML

12-1 INSERT Statements

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

The table copies will not inherit the associated primary-to-foreign-key integrity rules (relationship constraints) of the original tables.

Copy structure and data	Copy only structure

`CREATE TABLE copy_departments`
`as`
`SELECT * FROM departments;`
	`CREATE TABLE copy_departments`
	`   as (SELECT * FROM departments`
	`       where 1=2);`

Describe employees	SALARY NUMBER(6,2) Precision 6, Scale 2 [-9999.99, 9999.99]
user	select user from dual;
sysdate	select sysdate from dual; -- default DD-Mon-YYYY
	select to_char(sysdate, 'Month fmdd, yyyy') from dual;

select columns	all columns

`INSERT INTO copy_departments`
`   (department_id, department_name, location_id)`
`   VALUES (200,'Human Resources', 1500);`
	`INSERT INTO copy_departments`
	` VALUES (210,'Estate Management', 102, 1700);`

```
INSERT INTO copy_employees
  (employee_id, first_name, last_name, email, hire_date, salary)
  VALUES
  (302,'Grigorz','Polanski', 'GPolanski', TO_DATE('2017-07-20', 'yyyy-mm-dd'), 4200);
```

Insert multiple records at the same time

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

12-2 Updating Column Values and Deleting Rows

UPDATE	Modifies existing rows in a table
Correlated subquery UPDATE	retrieves information from one table & uses the information to update another table
Integrity Constraint	Ensures that the data adheres to a predefined set of rules
Correlated subquery DELETE	deletes information on a linked table based on what was deleted on the other table
Delete	Removes existing rows from a table

Not Correlated	**Correlated**

UPDATE copy_employees
SET hire_date = sysdate
WHERE employee_id = 206;
	UPDATE copy_employees
	SET hire_date = sysdate,
	    salary = (SELECT salary FROM copy_employees
	              WHERE employee_id= 205),
	    job_id = (SELECT job_id FROM copy_employees
	              WHERE employee_id= 205)
	WHERE employee_id = 206;

Correlated

ALTER TABLE copy_employees
ADD (department_name varchar2(30));
 	
select e.department_id, d.department_id, d.department_name
from employees e, departments d
where e.department_id = d.department_id;
 	
UPDATE copy_employees e
SET e.department_name= (SELECT d.department_name
                        FROM departments d
                        WHERE e.department_id= d.department_id);

Not Correlated	Correlated

DELETE FROM departments
WHERE department_id = 50;
 	
DELETE FROM copy_employees
WHERE department_id = 50;
	DELETE FROM copy_employees
	WHERE department_id =
	     (SELECT department_id FROM departments
	      WHERE department_name= 'Shipping');

Be carefully	

SELECT * FROM copy_employees e
WHERE e.manager_id IN
     (SELECT d.manager_id
      FROM employees d
      GROUP BY d.manager_id
      HAVING count(d.department_id) < 2);
	DELETE FROM copy_employees e
	WHERE e.manager_id IN
	     (SELECT d.manager_id
	      FROM employees d
	      GROUP BY d.manager_id
	      HAVING count(d.department_id) < 2);

row-level locks, until you issue a COMMIT or ROLLBACK

```
SELECT e.employee_id, e.salary, d.department_name
FROM employees e JOIN departments d USING (department_id)
WHERE location_id = 1500 AND job_id= 'ST_CLERK'
FOR UPDATE
ORDER BY e.employee_id;

GRANT update, select ON employees TO schemas

User: SCHEMAS
update ESQUEMAS.employees e set salary = salary
where e.employee_id = 141;
```

12-3 DEFAULT Values, MERGE, and Multi-Table Inserts

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, which presents a coherent picture of business conditions at a single point in time.

```
CREATE TABLE my_employees (
hire_date DATE DEFAULT SYSDATE,
first_name VARCHAR2(15),
last_name VARCHAR2(15));
```

```
-- Explicit
INSERT INTO my_employees
(hire_date, first_name, last_name)
VALUES (DEFAULT, 'Angelina','Wright');
```

```
-- Implicit
INSERT INTO my_employees
(first_name, last_name)
VALUES('Angelina','Wright');
```

```
UPDATE my_employees
SET hire_date = DEFAULT
WHERE last_name = 'Wright';
```

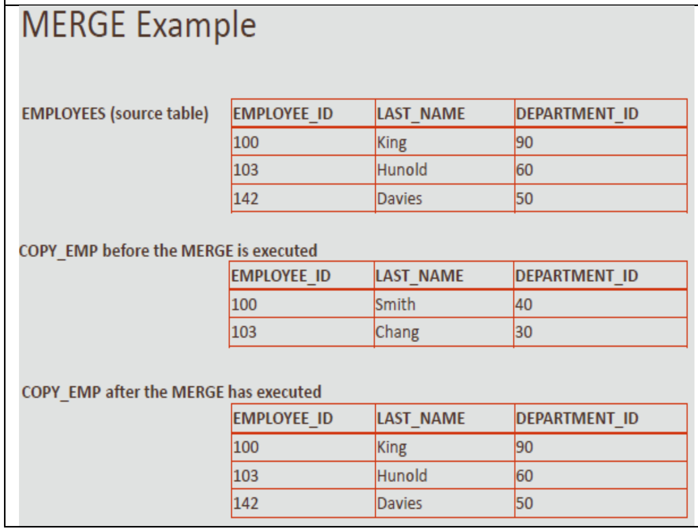
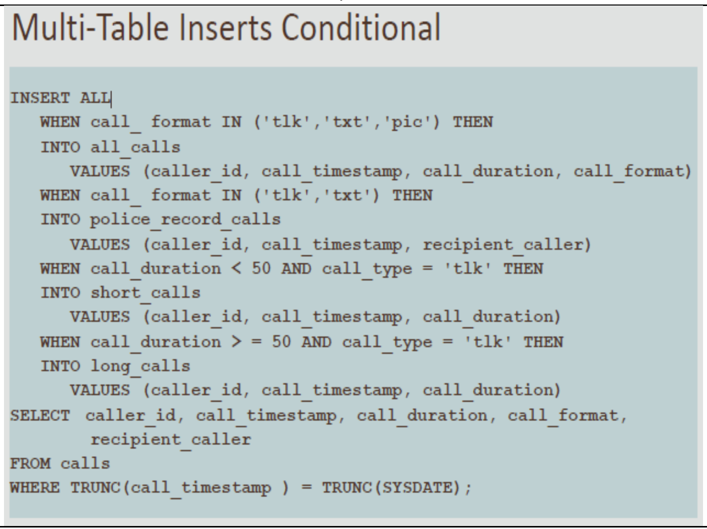
```
UPDATE my_employees
SET hire_date = '21-SEP-89'
WHERE last_name = 'Wright';
```

```
UPDATE copy_employees
SET hire_date = to_date('1989-09-21', 'yyyy-mm-dd')
WHERE employee_id = 100;
```

```
MERGE will INSERT and UPDATE
simultaneously.

MERGE INTO destination-table USING
source-table
ON matching-condition
WHEN MATCHED THEN UPDATE
SET ……
WHEN NOT MATCHED THEN INSERT
VALUES (……);
```

```
MERGE INTO copy_emp c USING employees e
ON (c.employee_id = e.employee_id)
WHEN MATCHED THEN UPDATE
    SET
        c.last_name = e.last_name,
        c.department_id = e.department_id
WHEN NOT MATCHED THEN INSERT
    VALUES (e.employee_id, e.last_name,
e.department_id);
```

	ALL , FIRST
	

MERGE Example

EMPLOYEES (source table)

EMPLOYEE_ID	LAST_NAME	DEPARTMENT_ID
100	King	90
103	Hunold	60
142	Davies	50

COPY_EMP before the MERGE is executed

EMPLOYEE_ID	LAST_NAME	DEPARTMENT_ID
100	Smith	40
103	Chang	30

COPY_EMP after the MERGE has executed

EMPLOYEE_ID	LAST_NAME	DEPARTMENT_ID
100	King	90
103	Hunold	60
142	Davies	50

Multi-Table Inserts Conditional

```
INSERT ALL
   WHEN call_ format IN ('tlk','txt','pic') THEN
   INTO all_calls
      VALUES (caller_id, call_timestamp, call_duration, call_format)
   WHEN call_ format IN ('tlk','txt') THEN
   INTO police_record_calls
      VALUES (caller_id, call_timestamp, recipient_caller)
   WHEN call_duration < 50 AND call_type = 'tlk' THEN
   INTO short_calls
      VALUES (caller_id, call_timestamp, call_duration)
   WHEN call_duration > = 50 AND call_type = 'tlk' THEN
   INTO long_calls
      VALUES (caller_id, call_timestamp, call_duration)
SELECT caller_id, call_timestamp, call_duration, call_format,
        recipient_caller
FROM calls
WHERE TRUNC(call_timestamp ) = TRUNC(SYSDATE);
```

Section 13 – DDL

13-1 Creating Tables

Data dictionary	Created and maintained by the Oracle Server and contains information about the database
Schema	A collection of objects that are the logical structures that directly refer to the data in the database
DEFAULT	Specifies a preset value if a value is omitted in the INSERT statement
Table	Stores data; basic unit of storage composed of rows and columns
CREATE TABLE	Command used to make a new table

Table names are not case sensitive.
Table names should be plural, for example STUDENTS, not student

The main database object types are:

Table	Index	Constraint	View	Sequence	Synonym

```
CREATE TABLE my_cd_collection (
cd_number NUMBER(3),
title VARCHAR2(20) not null,
artist VARCHAR2(20) check(regexp_like(artist,'[a-zA-Z .]')),
purchase DATE DEFAULT SYSDATE);
```

```
-- External Tables Example
CREATE TABLE emp_load (
    employee_number CHAR(5),
    employee_dob CHAR(20),
    employee_last_name CHAR(20),
    employee_first_name CHAR(15),
    employee_middle_name CHAR(15),
    employee_hire_date DATE )
ORGANIZATION EXTERNAL (
    TYPE ORACLE_LOADER
    DEFAULT DIRECTORY def_dir1
    ACCESS PARAMETERS
     (RECORDS DELIMITED BY NEWLINE
       FIELDS (employee_number CHAR(2),
               employee_dob CHAR(20),
               employee_last_name CHAR(18),
               employee_first_name CHAR(11),
               employee_middle_name CHAR(11),
               employee_hire_date CHAR(10) date_format DATE mask "mm/dd/yyyy"))
    LOCATION ('info.dat') );
```

User tables:	Data Dictionary tables (Only Select):

Employees
Departments
	SELECT * FROM DICTIONARY;
	SELECT * FROM USER_TABLES;
	SELECT * FROM USER_INDEXES;
	SELECT * FROM user_objects WHERE object_type= 'SEQUENCE';
	SELECT * FROM USER_SEGMENTS;
	SELECT * FROM ALL_TABLES;

13-2 Using Data Types

BLOB	Binary large object data up to 4 gigabytes
CLOB	Character data up to 4 gigabytes
INTERVAL YEAR TO MONTH	Allows time to be stored as an interval of years and months
INTERVAL DAY TO SECOND	Allows time to be stored as an interval of days to hours, minutes, and seconds
TIMESTAMP	Allows the time to be stored as a date with fractional seconds
TIMESTAMP WITH TIMEZONE	stores a time zone value as a displacement from Universal Coordinated Time or UCT
TIMESTAMP WITH LOCAL TIMEZONE	when a column is selected in a SQL statement the time is automatically converted to the user's timezone

• CHAR (fixed size,	maximum 2000 characters)
• VARCHAR2 (variable size,	maximum 4000 characters)
• NUMBER (variable size,	maximum precision 38 digits)
• DATE	range yyyy-mm-dd hh24:mi:ss
• TIMESTAMP	range yyyy-mm-dd hh12:mi:ss and fractions of a second
• INTERVAL DAY [(day_precision)] TO SECOND	The default precisión value is 2

```
select current_timestamp, SYSTIMESTAMP from dual
```

current_timestamp	03-OCT-22 05.22.33.598000000 PM AMERICA/MEXICO_CITY
SYSTIMESTAMP UCT	03-OCT-22 05.22.33.598000000 PM -05:00

MySQL Date yyyy-mm-dd	ORACLE Date yyyy-mm-dd hh:mi:ss
create table tmp_Formatos(Fecha date, FechaTiempo datetime, TiempoMarca timestamp);	create table tmp_Formatos(Fecha date, TiempoMarca timestamp);

select now(), sysdate(), current_timestamp();	select sysdate, current_date,
	       current_timestamp, SYSTIMESTAMP
	from dual;

insert into tmp_Formatos values(sysdate(), sysdate(), sysdate());	insert into tmp_Formatos values(sysdate, sysdate);
Select * from tmp_formatos;	select * from tmp_formatos;

select second(fechaTiempo),
        extract(second from TiempoMarca)
from tmp_formatos;
	select to_char(fecha, 'ss'),
	       extract(second from TiempoMarca)
	from tmp_formatos;

create table tmp_Horarios (Fecha date, TS TIMESTAMP, TS_TZ TIMESTAMP WITH TIME ZONE, TS_LTZ TIMESTAMP WITH LOCAL TIME ZONE);	create table tmp_Intervalos (loan1 INTERVAL YEAR TO MONTH, loan2 INTERVAL YEAR TO MONTH);

insert into tmp_horarios values
(sysdate, sysdate, SYSTIMESTAMP, sysdate);
	INSERT INTO tmp_Intervalos (loan1, loan2)
	VALUES (INTERVAL '121' MONTH(3),
	        INTERVAL '3-6' YEAR TO MONTH);

	select sysdate+loan1 from tmp_intervalos;

13-3 Modifying a Table

You can add or modify a column in a table, but you cannot specify where the column appears

```
ALTER TABLE tablename
ADD (column_name data_type [DEFAULT expression],
     column_name data_type [DEFAULT expression], ...);
```

```
ALTER TABLE mod_emp
MODIFY (salary NUMBER(8,2) DEFAULT 50);
```

```
ALTER TABLE tablename
DROP COLUMN columnname;
```

```
-- Dropping a column from a large table can take a long time
ALTER TABLE tablename SET UNUSED (column_name);
```

```
-- when you want to reclaim the extra disk space
ALTER TABLE copy_employees
   DROP UNUSED COLUMNS;
```

```
ALTER SESSION SET RECYCLEBIN = ON;
DROP TABLE table_name;
```

`FLASHBACK TABLE table_name TO BEFORE DROP;`	`select * from USER_RECYCLEBIN;`
`DROP TABLE Table_Name PURGE;`	`RENAME old_name to new_name;`

it does not release storage space	Free up storage space
Delete from Table_Name;	Truncate Table Table_Name;

```
COMMENT ON TABLE Employees is 'Tabla de empleados';
comment on column Employees.last_name is 'Apellido Paterno';
```

```
select * from user_tab_comments;
SELECT * FROM USER_COL_COMMENTS;
```

	Review the changes made (UNDO tablespace) SCN (System Change Number)

UPDATE EMPLOYEES
SET LAST_NAME = 'King Kong'
where employee_id = 100;
	select * from Employees
	VERSIONS BETWEEN SCN MINVALUE AND MAXVALUE
	WHERE employee_id= 100;

Section 14 – Constraints

14-1 Intro to Constraints; NOT NULL and UNIQUE Constraints

Constraint	Database rule.
PRIMARY KEY	Constraint ensures that the column contains no null values and uniquely identifies each row of the table
UNIQUE KEY	An integrity constraint that requires every value in a column or set of columns be unique
UNIQUE constraint	Every value in a column or set of columns (a composite key) must be unique
FOREIGN KEY	Designates a column (child table) that establishes a relationship between a primary key in the same table and a different table (parent table)
REFERENCES	Identifies that table and column in the parent table
NOT NULL constraint	For every row entered into the table, there must be a value for that column
CHECK constraint	Specifies a condition for a column that must be true for each row of data
Table level constraint	References one or more columns and is defined separately from the definitions of the columns in the table
Column-level constraint	Database rule that references a single column

14-2 PRIMARY KEY, FOREIGN KEY, and CHECK Constraints

14-3 Managing Constraints

Section 15 – Views

15-1 Creating Views

15-2 DML Operations and Views

15-3 Managing Views