Using SQL to Insert, Update, Delete Data

Practical 10

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Lesson Objectives

- Insert data into database tables.
- Update and delete database records.
- Difference between truncate(DDL) and delete(DML).

Introduction to SQL

- Structured Query Language (SQL): The standard query language for relational databases.
  - Data Query Language (DQL)
    - View database data – Select.
  - **Data Manipulation Language (DML)**
    - **Insert, update, delete database data.**
  - Data Definition Language (DDL)
    - Create new database objects.
    - Modify or delete existing database objects.
  - Data Control Language (DCL)
    - Grant privileges and assign storage area to user.
  - Transaction Control Language (TCL)
    - Statement used to manage the changes made by DML.
    - COMMIT, ROLLBACK, SAVEPOINT.

Inserting Data into Tables

- INSERT command adds new records.
- Field values should match column order, or be specified in command.

INSERT INTO TableName [(columnList)]

VALUES (dataValueList)

- *columnList* is optional; if omitted, SQL assumes a list of all columns in their original CREATE TABLE order.
- Any columns omitted must have been declared as NULL or a DEFAULT was specified when table was created.

Inserting Data into Tables

- Insert value by specifying column name:

```
INSERT INTO location (LOC_ID, BLDG_CODE, ROOM, CAPACITY)
VALUES (14, 'BUS', '424', 1);
```

- Insert value without specifying column name:

```
INSERT INTO location
VALUES (15, 'BUS', '242', 2);
```

Inserting Data into Tables

- Insert value by specifying column name and having null value at one column:

```
INSERT INTO location (LOC_ID, BLDG_CODE, ROOM, CAPACITY)
VALUES (16, 'BUS', '123', NULL);
```

- Insert value without specifying column name and having null value at one column:

```
INSERT INTO location
VALUES (17, 'BUS', '321', NULL);
```

Inserting Data into Tables

INSERT INTO location VALUES ('BUS', 18, '123', 1);

Error: invalid number

(SQL assumes a list of all columns in their original order)

INSERT INTO faculty VALUES (1, 'Cox', 'Kim', 'J', 9);

Error: not enough values

INSERT INTO faculty (F_ID, F_LAST, F_FIRST,
F_MI, LOC_ID) VALUES (1, 'Cox', 'Kim', 'J', 9);

Error: unique constraint (SYSTEM.FACULTY_F_ID_PK)
violated

Inserting Date Values

- The default format for date DD-MON-RR.
- Use TO_DATE function to convert a character string to a date.
  - Specify date string and matching format model.
  - TO_DATE('08/24/2004', 'MM/DD/YYYY')
  - TO_DATE('10:00 AM', 'HH:MI AM')

Inserting Date Values

```
INSERT INTO student
VALUES (7, 'Miller', 'Sarah', 'M', '144 Blvd.', 'Eau ',
'WI', '54703', '7155559876', 'SR', '07/14/1985', 8891, 1,
    NULL);
```

Error: not a valid month

Inserting Date Values

```
INSERT INTO student
VALUES (7, 'Miller', 'Sarah', 'M', '144 Blvd.', 'Eau ',
'WI', '54703', '7155559876', 'SR',
    TO_DATE('07/14/1985', 'MM/DD/YYYY'), 8891,
    1, NULL);
```

Inserting Date Values

```
INSERT INTO student
VALUES (8, 'Miller', 'Sarah', 'M', '144 Blvd.', 'Eau ',
'WI', '54703', '7155559876', 'SR', '14-July-1985', 8891,
    1, NULL);
```

Inserting Date Values

- The SYSDATE function records the current date and time.

```
INSERT INTO student VALUES (9, 'Miller', 'Sarah',
    'M', '144 Blvd.', 'Eau ', 'WI', '54703', '7155559876',
    'SR', SYSDATE, 8891, 1, NULL);
```

Inserting Special Symbol

INSERT INTO student VALUES (10, 'O'Connell', 'Sarah', 'M', '144 Blvd.', 'Eau ', 'WI', '54703', '7155559876', 'SR', SYSDATE, 8891, 1, NULL);

Error: quoted string not properly terminated

Inserting Special Symbol

INSERT INTO student VALUES (10, 'O''Connell', 'Sarah', 'M', '144 Blvd.', 'Eau ', 'WI', '54703', '7155559876', 'SR', SYSDATE, 8891, 1, NULL);

Updating Existing Table Records

UPDATE:

- Updates field values in one or more records in a table.
- Only one table may be updated at a time.
- *UPDATE tablename SET field1= new_value1, field2 = new_value2, ... WHERE search condition;*
- Specific row or rows are modified if you specify the WHERE clause.

SELECT f_id, f_rank FROM faculty;

UPDATE faculty
SET f_rank = 'FULL'
WHERE f_id = 1;

SELECT f_id, f_rank FROM faculty;

Updating Existing Table Records

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

```
SELECT f_id, f_rank FROM faculty;

UPDATE faculty
SET f_rank = 'FULL';

SELECT f_id, f_rank FROM faculty;

ROLLBACK;
```

Updating Existing Table Records

- Multiple columns of data can be updated at the same time as follows:

```
SELECT * FROM location;

UPDATE location
SET bldg_code = 'BUS', room = '100', capacity = 50
WHERE loc_id = 1;

SELECT * FROM location;

ROLLBACK;
```

Deleting Existing Table Records

DELETE:

- Removes specific records from a database table.
- If search condition is omitted, entire table data is removed.
- *DELETE FROM tablename WHERE condition;*
- Specific row or rows are deleted if you specify the WHERE clause.

SELECT * FROM enrollment;

DELETE FROM enrollment WHERE s_id = 4;

SELECT * FROM enrollment;

ROLLBACK;

SELECT * FROM enrollment;

Deleting Existing Table Records

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

  DELETE FROM enrollment;

  SELECT * FROM enrollment;

  ROLLBACK;

  SELECT * FROM enrollment;

Deleting Existing Table Records

- Specific row or rows are deleted if you specify the WHERE clause.

```
DELETE FROM student
WHERE s_first = 'Sarah' AND s_last = 'Miller';

DELETE FROM location WHERE loc_id = 9;
```

Error: integrity constraint violated – child record found

```
DELETE FROM enrollment WHERE s_id = 4;
```

TRUNCATE Table Records

- TRUNCATE is Data Definition Language.
- Removes all of the table data without saving any rollback information
- Must disable foreign key constraints before truncating table

TRUNCATE TABLE tablename;

SELECT * FROM ENROLLMENT;

TRUNCATE TABLE ENROLLMENT;

SELECT * FROM ENROLLMENT;

Rollback;

SELECT * FROM ENROLLMENT;

Truncate vs. Delete vs. Drop

- What is the different between truncate and delete?

TRUNCATE	DELETE
Removes all rows from a table and releases the storage space used by that table	Remove all rows from a table but does not release storage space
Cannot rollback (DDL)	Can rollback (DML)

- What is the different between truncate and drop?

TRUNCATE	DROP
To delete all rows from a table	To delete the entire table

- Try the exercise given.