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CONL
705

Database Systems

5.1.6: Modifying Tables - Examples

ALTER TABLE

Using ALTER TABLE

Additional Attributes/Columns can be added (ADD)

Existing attributes

- Can be modified (change data type and/or size) (MODIFY)
- Can be deleted (DROP)
- Can be renamed (RENAME)

Constraints

- Can be added and deleted (ADD, DROP)
- Can be disabled and enabled (DISABLE, ENABLE)
- Can be renamed (RENAME)

Syntax

ALTER TABLE *TableName*

[ADD [COLUMN] columnName dataType [NOT NULL] [UNIQUE] [DEFAULT defaultOption] [CHECK (searchCondition)]]

[DROP [COLUMN] columnName [RESTRICT | CASCADE]]

[ADD [CONSTRAINT [ConstraintName]] tableConstraintDefinition]

[DROP CONSTRAINT ConstraintName [RESTRICT | CASCADE]]

[ALTER [COLUMN] SET DEFAULT defaultOption]

[ALTER [COLUMN] DROP DEFAULT]

ADD COLUMN

- The Author table has three columns.

  DESC AUTHOR;

Name	Null	Type
------------	-------	------------
AUTHOR_NUM	NOT NULL	NUMBER(4)
AUTHOR_LAST		VARCHAR2(12)
AUTHOR_FIRST		VARCHAR2(10)

- Add a column to store Telephone number of the Author .

  ALTER TABLE AUTHOR **ADD** TEL NUMBER(12);

  DESC AUTHOR;

Name	Null	Type
------------	--------	------------
AUTHOR_NUM	NOT NULL	NUMBER(4)
AUTHOR_LAST		VARCHAR2(12)
AUTHOR_FIRST		VARCHAR2(10)
TEL		NUMBER(12)

MODIFY COLUMN

- Telephone number being Numeric can't take initial 0, change the data type the CHAR.

  ALTER TABLE   AUTHOR

  MODIFY   TEL   CHAR(12);

  DESC AUTHOR;

Name	Null	Type
----------- -	-------	-----------
AUTHOR_NUM	NOT NULL	NUMBER(4)
AUTHOR_LAST		VARCHAR2(12)
AUTHOR_FIRST		VARCHAR2(10)
TEL		**CHAR(12)**

- Rename the column Tel to Tel_Num.

  ALTER TABLE   AUTHOR

  RENAME COLUMN   TEL   **TO** TEL_NUM;

  DESC AUTHOR;

Name	Null	Type
----------- -	-------	-----------
AUTHOR_NUM	NOT NULL	NUMBER(4)
AUTHOR_LAST		VARCHAR2(12)
AUTHOR_FIRST		VARCHAR2(10)
TEL_NUM		CHAR(12)

DROP COLUMN

DESC AUTHOR;

Name	Null	Type
------------ -	-------	------------
AUTHOR_NUM	NOT NULL	NUMBER(4)
AUTHOR_LAST		VARCHAR2(12)
AUTHOR_FIRST		VARCHAR2(10)
TEL_NUM		CHAR(12)

- Column can be dropped using DROP

  ALTER TABLE AUTHOR **DROP** (TEL_NUM);

- DESC AUTHOR;

Name	Null	Type
------------ -	-------	------------
AUTHOR_NUM	NOT NULL	NUMBER(4)
AUTHOR_LAST		VARCHAR2(12)
AUTHOR_FIRST		VARCHAR2(10)

DROP Multiple Columns

- Deleting Multiple Columns (GRADE table).

    DESC GRADE;

    ```
    Name                          Null      Type
    --------------------          --------  -------------
    STUDENT_ID                    NOT NULL  NUMBER(8)
    SECTION_ID                    NOT NULL  NUMBER(8)
    GRADE_TYPE_CODE               NOT NULL  CHAR(2)
    GRADE_CODE_OCCURRENCE         NOT NULL  NUMBER(38)
    NUMERIC_GRADE                 NOT NULL  NUMBER(3)
    COMMENTS                                VARCHAR2(2000)
    CREATED_BY                    NOT NULL  VARCHAR2(30)
    CREATED_DATE                  NOT NULL  DATE
    MODIFIED_BY                   NOT NULL  VARCHAR2(30)
    MODIFIED_DATE                 NOT NULL  DATE
    ```

ALTER TABLE   GRADE

DROP   (MODIFIED_BY , MODIFIED_DATE);

DESC GRADE;

```
Name                          Null      Type
--------------------          --------  -------------
STUDENT_ID                    NOT NULL  NUMBER(8)
SECTION_ID                    NOT NULL  NUMBER(8)
GRADE_TYPE_CODE               NOT NULL  CHAR(2)
GRADE_CODE_OCCURRENCE         NOT NULL  NUMBER(38)
NUMERIC_GRADE                 NOT NULL  NUMBER(3)
COMMENTS                                VARCHAR2(2000)
CREATED_BY                    NOT NULL  VARCHAR2(30)
CREATED_DATE                  NOT NULL  DATE
```

Modify Constraints

- Create DEPARTMENT table DPNT

  CREATE TABLE DPNT

  (DEPTNO NUMBER(2),

  DNAME VARCHAR2(20),

  LOC VARCHAR2 (25));

- Create EMPLOYEE table EMPL

  CREATE TABLE EMPL

  (EMPNO NUMBER(4),

  JOB VARCHAR2(20),

  MGR NUMBER(4),

  HIREDATE DATE,

  SAL NUMBER(7,2),

  COMM NUMBER (7, 2),

  DEPTNO NUMBER(2));

ADD Constraints

- Add Primary Key

    ALTER TABLE EMPL **ADD PRIMARY KEY** (EMPNO);

- Add Validation Rule (CHECK constraint)

    ALTER TABLE EMPL **ADD CHECK** (SAL <5000.99) ;

- Add Foreign Key

    ALTER TABLE EMPL **ADD FOREIGN KEY** (DEPTNO)   REFERENCES DPNT(DEPTNO);

    –   Check the result - Error ?

Modifying Constraints

- Adding Constraints

  ALTER TABLE EMPL **ADD FOREIGN KEY** (DEPTNO) REFERENCES DPNT(DEPTNO);

  - Error report -

    ORA-02270: no matching unique or primary key for this column-list

    02270. 00000 - "no matching unique or primary key for this column-list"

    *Cause: A REFERENCES clause in a CREATE/ALTER TABLE statement gives a column-list for which there is no matching unique or primary key constraint in the referenced table.

    *Action: Find the correct column names using the ALL_CONS_COLUMNS catalog view

- Modify the DPNT table

  - Add Primary Key

    ALTER TABLE **DPNT**

    ADD PRIMARY KEY (DEPT_NO);

    Result: Table DPNT altered.

- Modify EMPNL add foreign key

  ALTER TABLE EMPL

  ADD FOREIGN KEY (DEPTNO) REFERENCES DPNT(DEPTNO);

  Result: Table EMPL altered.

Modifying Constraints

- Disabling constraints – disable CHECK constraint on EMPL (remember to find the appropriate constraint name)

  ALTER TABLE EMPL

  DISABLE CONSTRAINT *SYS_C0022166*;   /*please find the appropriate constraint name from your table*/

- Enable constraints

  ALTER TABLE EMPL

  ENABLE CONSTRAINT *SYS_C0022166*;   /*same name as above*/

- Rename constraints

  ALTER TABLE EMPL

  RENAME CONSTRAINT *SYS_C0022166* **TO** EMPL_CHECK_SAL;   /*rename the from the name above to EMPL_CHECK_SAL*/

- Delete Constraint

  ALTER TABLE EMPL

  DROP CONSTRAINT EMPL_CHECK_SAL;

DROP CASCADE

- Column that has references cannot be dropped using simple DROP.

    ALTER TABLE DPNT   **DROP**   (DEPTNO);

- Error report -

    ORA-12992: cannot drop parent key column

    12992. 00000 - "cannot drop parent key column"

    *Cause: An attempt was made to drop a parent key column.

    *Action: Drop all constraints referencing the parent key column, or specify CASCADE CONSTRAINTS in statement.

- Column can be dropped using DROP with CASCADE

    ALTER TABLE DPNT
    DROP (DEPTNO) CASCADE CONSTRAINTS;

    DESC DPNT;

Name	Null?	Type
DNAME		VARCHAR2(20)
LOC		VARCHAR2(25)

- Please note its not the primary key constraint prevented the DROP, it's the foreign key constraint defined in the EMPL table.
- Columns can be dropped even if it's a primary key, however if it is referenced from any other objects you must use CASCADE.

Deleting Tables - DROP

- Can correct errors by dropping (deleting) a table and starting over

- Useful when table is created before errors are discovered

- Command is followed by the table to be dropped and a semicolon

- Any data in table also deleted

DROP Table to correct mistakes

- DPNT was created with no Primary key

  DROP TABLE DPNT; /*only works if you completed the previous steps, especially dropping the DEPNO*/

- Create DPNT Table

  CREATE TABLE DPNT

  (DEPTNO NUMBER(2) PRIMARY KEY,

  DNAME VARCHAR2(20),

  LOC VARCHAR2 (25));

- Drop the table EMPL

  DROP TABLE EMPL;

- Create the table EMPL

  CREATE TABLE EMPL

  (EMPNO NUMBER(4) PRIMARY KEY,

  JOB VARCHAR2(20),

  MGR NUMBER(4),

  HIREDATE DATE,

  SAL NUMBER(7,2),

  COMM NUMBER (7, 2),

  DEPTNO NUMBER(2) REFERENCES DPNT (DEPTNO)

  );

Deleting Tables - DROP

- Generally to delete a table use DROP TABLE followed by the table the table name.

  DROP TABLE *DPNT* ;

- *Even though the same statement worked in the previous slide, here it will be an error as DPNT is a parent table.*

- If the table is a Parent Table

  - All the Child tables must be deleted (dropped) before the Parent table

  - Or use

  DROP TABLE *DPNT* **CASCADE CONSTRAINTS**;

  */*Result: Table DPNT dropped. */*