Nepal College of Information Technology

Balkumari

Database Management System

Lab 1

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Title: Data Definition Language (DDL) Commands

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Objective:

To practice and implement data definition language commands and constraints.

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Procedure:

1. DDL Command
   - Is used to communicate with database.
   - Is used to
     - Create an object
     - Alter the structure of object
     - To drop the object created
   - Commands used are: CREATE, ALTER, DROP, TRUNCATE

2. Constraint
   - Constraints are the rules or definition that governs the operations in the data. Constraints can be done at the column level or at the table level depending upon the requirement.
   - Three types of constraints
     - Integrity Constraint
       - ♦ NOT NULL Constraint
       - ♦ NULL Constraint
       - ♦ UNIQUE Constraint

- Entity Constraint (Primary Key)
- Referential Constraint (Foreign Key)

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SQL Commands:

1. **CREATE TABLE**
   - Is used to create a table.
   - Syntax:
     CREATE TABLE <table_name>
     (
     <Column_name1> <data_type>,
     <Column_name2> <data_type>,
     ……..
     ……..
)
   - Example:
     CREATE TABLE student
     (
     St_roll int,
     St_name varchar(50),
     St_address varchar(50)
)

2. **ALTER TABLE**
   - Is used to add, delete, or modify columns in a table.
   - Syntax:
     - **To add a column in a table**
       ALTER TABLE <table_name>
       ADD <column_name><data_type>
     - **To delete a column in a table**
       ALTER TABLE <table_name>
       DROP COLUMN <column_name>
     - **To change data type of column in a table**
       ALTER TABE <table_name>
       MODIFY <column_name><data_type>

- Example:
  - **To add a column in a table**
    ALTER TABLE student
    ADD email varchar(50)
  - **To delete a column in a table**
    ALTER TABLE student
    DROP COLUMN email
  - **To change data type of column in a table**
    ALTER TABLE student
    MODIFY name char(10)

3. **DROP TABLE**
   - Is used to delete a table
   - Syntax:
     DROP TABLE <table_name>
   - Example:
     DROP TABLE student

4. **TRUNCATE TABLE**
   - Is used to delete records of table retaining the table structure.
   - Syntax:
     TRUNCATE TABLE <table_name>
   - Example:
     TRUNCATE TABLE student

Constraints

❖ **NOT NULL**
- ➢ Enforce a field to always have a value
- ➢ Example:

```
CREATE TABLE teacher
(
T_id int NOT NULL,
T_name varchar(50) NOT NULL,
T_address varchar(50),
T_email varchar(25)
)
```

- **UNIQUE**
  - Ensures that information in column for each record is unique.
  - Example 1:

```
CREATE TABLE teacher
(
T_id int NOT NULL UNIQUE,
T_name varchar(50) NOT NULL,
T_address varchar(50),
T_email varchar(25)
)
```

  - Example 2:

```
CREATE TABLE teacher
(
T_id int NOT NULL ,
T_name varchar(50) NOT NULL,
T_address varchar(50),
T_email varchar(25),
CONSTRAINT u_nid UNIQUE (T_id,T_name)
)
```

  - Example 3

```
ALTER TABLE teacher
ADD UNIQUE (T_id)
```

  - Example 4:

```
ALTER TABLE teacher
ADD CONSTRAINT u_nid UNIQUE (T_id,T_name)
```

  - Example 5:

```
ALTER TABLE teacher
DROP INDEX u_nid
```

- **PRIMARY KEY**
  - Uniquely identifies each record in a table.
  - Cannot contain NULL values.

- Example 1:

```
CREATE TABLE teacher
(
T_id int NOT NULL PRIMARY KEY,
T_name varchar(50) NOT NULL,
T_address varchar(50),
T_email varchar(25)
)
```

- Example 2:

```
CREATE TABLE teacher
(
T_id int NOT NULL ,
T_name varchar(50) NOT NULL,
T_address varchar(50),
T_email varchar(25),
CONSTRAINT pk_nid PRIMARY KEY (T_id,T_name)
)
```

- Example 3:

```
ALTER TABLE teacher
ADD PRIMARY KEY (T_id)
```

- Example 4:

```
ALTER TABLE teacher
ADD CONSTRAINT pk_nid PRIMARY KEY (T_id,T_name)
```

- Example 5:

```
ALTER TABLE teacher
DROP CONSTRAINT pk_nid
```

❖ FOREIGN KEY

- Points to ***Primary Key*** of another table

- Example 1:
```
CREATE TABLE teacher
(
T_id int NOT NULL PRIMARY KEY,
T_name varchar(50) NOT NULL,
T_address varchar(50),
T_email varchar(25),
D_id int FOREIGN KEY  REFERENCES department(D_id)
)
```
- Example 2:
```
CREATE TABLE teacher
(
T_id int NOT NULL PRIMARY KEY,
D_id int,
T_name varchar(50) NOT NULL,
T_address varchar(50),
T_email varchar(25),
CONSTRAINT fk_td FOREIGN KEY (D_id)  REFERENCES department(D_id)
)
```
- Example 3:
```
ALTER TABLE teacher
ADD FOREIGN KEY (D_Id) REFERENCES department(D_Id)
```
- Example 4:
```
ALTER TABLE teacher
ADD CONSTRAINT fk_td FOREIGN KEY (D_id)  REFERENCES
department(D_id)
```
- Example 5:
```
ALTER TABLE teacher
DROP FOREIGN KEY fk_td
```

❖ **CHECK**

- Allows only a particular range of values.

- Example 1:

```
CREATE TABLE teacher
(
T_id int NOT NULL CHECK (T_id>0),
T_name varchar(50) NOT NULL,
T_address varchar(50),
T_email varchar(25),
)
```

- Example 2:

```
CREATE TABLE teacher
(
T_id int NOT NULL ,
T_name varchar(50) NOT NULL,
T_address varchar(50),
T_email varchar(25),
CONSTRAINT chk_teacher CHECK (T_id>0 AND T_address='kathmandu')
)
```

- Example 3:

```
ALTER TABLE teacher
ADD CHECK (T_id>0)
```

- Example 4:

```
ALTER TABLE teacher
ADD CONSTRAINT chk_teacher CHECK (T_id>0 AND
T_address='kathmandu')
```

- Example 5:

```
ALTER TABLE teacher
DROP CONSTRAINT chk_teacher
```

……

LAB EXERCISE:

1. Create a table called Employee with following structure:

Column Name	**Data Type**
E_ID	int
E_Name	varchar(25)
E_Address	varchar(50)
D_ID	int

   Allow NULL for all columns except E_ID and E_Name

2. Add a column JoinDate in table Employee.
3. Modify a column JoinDate of table Employee.
4. Create a table called Department with following structure:

Column Name	**Data Type**
D_ID	int
D_Name	varchar(15)

   D_ID as a primary key

5. Add constraint to specify D_ID as Foreign Key in Employee table.
6. Drop a column JoinDate in table Employee.
7. Truncate Employee table and Drop Department table.

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