Data Definition with SQL

Vu Tuyet Trinh
trinhvt@soict.hut.edu.vn

Department of Information Systems, Faculty of Information Technology
Hanoi University of Technology

Languages of DBMS

- Data Definition Language (DDL)
  - define the logical schema (relations, views, …) and storage schema stored in a Data Dictionary
- Data Manipulation Language (DML)
  - Manipulative populate schema, update database
  - Retrieval querying content of a database
- Data Control Language (DCL)
  - permissions, access control, ...

Syntax

- Creating table

```
CREATE TABLE tab(
        col1 type1(size1)[NOT NULL], ...,
        col2 type2(size2)[NOT NULL], ...,
                .....
        [CONSTRAINT <constraint name> <constraint type> clause]
        ...
)
```

- Deleting table

```
                  DROP TABLE tab
```

Naming & Data Type

- Naming convention
  - 32 characters: a..z, 0..9, _

- Datatype (SQL-92)
  - CHAR(n)
  - VARCHAR(n)
  - Int
  - Smallint
  - Numeric(p,d)
  - Real, double
  - float(n)
  - Date
  - time

Entity Integrity

- Domain value

  CONSTRAINT <name>
  CHECK <condition>

- Primary key

  CONSTRAINT <name> **PRIMARY KEY** (fk1,fk2,…)

Referential Integrity

- Foreign key

  ```
  CONSTRAINT <name> FOREIGN KEY (fk1,fk2,…)
                         REFERENCES tab(k1,k2)
  ```

- Options
  - CASCADE DELETE | UPDATE
    - Delete/update all matching foreign key tuples
  - RESTRICT
    - can’t delete primary key tuple whilst a foreign key tuple matches

Example

```
CREATE TABLE Student(
        Id char(4)NOT NULL,
        Name varchar(30)NOT NULL,
        Suburb varchar(30),
        CONSTRAINT key_Stud
                        PRIMARY KEY  Id
   )
```

Id	Name	Suburb
1108	Robert	Kew
3936	Glen	Bundoora
8507	Norman	Bundoora
8452	Mary	

```
CREATE TABLE Takes(
        SID char(4)NOT NULL,
        SNO char(2)NOT NULL,
        CONSTRAINT key_takes
                PRIMARY KEY  (SID,SNO),
        CONSTRAINT key_2Stud
                FOREIGN KEY  (SID)
                REFERENCES  Student(Id)
   )
```

SID	SNO
1108	21
1108	23
8507	23
8507	29

Modifying Data Structure

- □ Add column(s)

  ALTER TABLE <table_name>
  ADD COLUMN <column_name> <datatype> [NOT NULL]

- □ Delete column(s)

  ALTER TABLE <table_name>
  DROP COLUMN <column_name>

- □ Modify column(s)

  ALTER TABLE <table_name>
  CHANGE COLUMN <column_name> <new datatype>

Modifying constraints

- □ Add new constraint(s)

  ALTER TABLE <table_name>
  ADD CONSTRAINT <constraint_name> <constriant_type>

- □ Delete existing constraints

  ALTER TABLE <table_name>

  DROP CONSTRAINT <constraint_name>

View : Logical Data Independence

Student

Id	Name	Suburb
1108	Robert	Kew
3936	Glen	Bundoora
8507	Norman	Bundoora
8452	Mary	Balwyn

```
create view List_student  as
    (select id, Name
    from Student
    )
```

List_Student

Id	Name
1108	Robert
3936	Glen
8507	Norman
8452	Mary

```
Drop view List_student
```

Create user command

- □ Syntax
  - Creating

    CREATE USER *username*

    IDENTIFIED {BY *password* | EXTERNALLY | GLOBALLY AS '*external_name*'};

  - Deleting

    DROP USER name [CASCADE];

- □ Example

  CREATE USER *toto*

  IDENTIFIED BY pwdtoto

Grant / Revoke

- □ Syntax

  Grant <privilege> On <Object> To <user>
  [With Grant Option]

  REVOKE <privilege> ON <Object> FROM <user>
  [RESTRICT | CASCADE]

Privilege = {Insert | Update | Delete | Select |
Create Alter | Drop | Read | Write}
Object = {Table | View}

- □ Example

  GRANT SELECT ON ENROL TO toto

  GRANT SELECT, UPDATE ON ENROL TO teacher
  WITH GRANT OPTION