

SQL



SQL សម្រាប់ "Structured Query Language"

គីឡូការណ៍

គីឡូការណ៍ នៃការបង្កើត

SQL - 1999

(data mining , data warehouse , multimedia ទិន្នន័យ ...)

table = relation

SQL - 2006

row = tuple

(នឹង XML)

column = Attribute

↓

Schema & Catalog Concept

SQL schema
L Schema element

↑
↑ 2008
(object-oriented)

↓
SQL - 3

(base from SQL-1999 , RDBMS)

គីឡូការណ៍ SQL schema → ទីនាយករដ្ឋ DBMS (នូវឱ្យឱ្យការពារិភ័យនា DBMS)

- schema name
- ព្រមទាំងទាំង 2 ការចិត្តរាយ និង Element

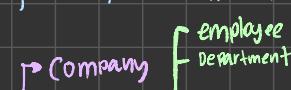
នៅលើ: Schema element

- table , constraints , views , domains ឬ: constructs និង
- នាមឈរ ;

ក្នុងនៅ

Cluster > Catalog > schema > table > row , column
(SQL)

និង collection name នៃ schema នៃ SQL environment



ការសរុប Schema & table

Create Schema : CREATE SCHEMA COMPANY

AUTHORIZATION 'Jsmith' ; → រាយការណ៍ នៃការបង្កើត
→ និងការបង្កើត user ។
→ ឯងជាការបង្កើត

Create table : CREATE TABLE COMPANY.EMPLOYEE

CREATE TABLE EMPLOYEE

→ ក្នុងនៃការបង្កើតក្នុង DB default

→ នៃការបង្កើតក្នុង DB

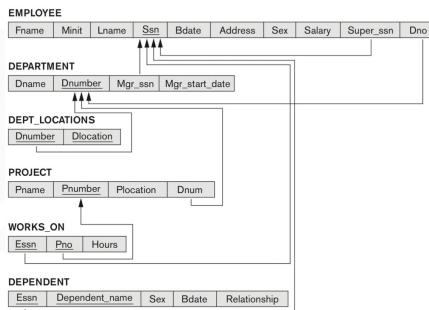
✓

Base tables : Relation and row តាមការបង្កើតក្នុង file និង DBMS

Virtual relations (views) : CREATE VIEW និងការបង្កើត

Schema

COMPANY relational database schema (Fig. 5.7)



One possible database state for the COMPANY relational database schema (Fig. 5.6)

EMPLOYEE

Essn	Minit	Lname	Sex	Bdate	Address	Sex	Salary	Super_ssn	Dno
John B Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	123456789	5		
Franklin T Wong	334455667	1965-12-08	123 Elmwood, Houston, TX	M	40000	123456789	5		
Jennifer S Wilson	987654321	1984-08-20	291 Berry, Belton, TX	F	42000	123456789	4		
Renee K Narayan	666888444	1969-02-15	975 Fire Oak, Humble, TX	F	38000	123445555	5		
Joyce A English	453453453	1972-03-31	5631 Rice, Houston, TX	F	25000	123445555	5		
Ahmed V Jelbar	989899898	1969-01-29	9801 Dallas, Houston, TX	M	25000	123456789	4		
James E Borg	888866555	1937-11-10	450 Stone, Houston, TX	M	30000	NULL	1		

DEPARTMENT

Dname	Dnumber	Mgr	Mgr_start_date
Research	5	93344555	1988-09-22
Administration	4	989899898	1991-01-01
Headquarters	1	888866555	1981-08-19

DEPT_LOCATIONS

Dnumber	Dlocation
1	Houston
4	Bellmead
5	Bethpage
5	Sugarland
5	Houston

WORKS_ON

Essn	Pno	Hours
99988777	30	30.0
123456789	2	7.5
666888444	9	40.0
453453453	1	20.0
333445555	2	30.0
333445555	2	10.0
333445555	9	10.0
333445555	10	10.0

DEPENDENT

Dependent_name	Sex	Bdate	Relationship
Alice	F	1960-04-05	Daughter
Theodore	M	1960-10-25	Son
Jay	F	1960-06-03	Spouse
Michael	M	1960-07-01	Daughter
Michael	M	1960-01-01	Son
Elizabeth	F	1960-12-30	Daughter
Elizabeth	F	1960-05-05	Spouse

snapshot b table

SQL CREATE TABLE data definition statements for defining the COMPANY schema from Figure 5.7 (Fig. 6.1)

```

CREATE TABLE EMPLOYEE
( Fname          VARCHAR(15)      NOT NULL,
  Minit          CHAR,           NOT NULL,
  Lname          VARCHAR(15)      NOT NULL,
  Ssn            CHAR(9),        NOT NULL,
  Bdate          DATE,           NOT NULL,
  Address        VARCHAR(30),
  Sex            CHAR,
  Salary          DECIMAL(10,2),
  Super_ssn     CHAR(9),
  Dno            INT             NOT NULL,
  PRIMARY KEY (Ssn),
  FOREIGN KEY (Dno)
    REFERENCES DEPARTMENT(Dnumber),
    UNIQUE (Dname),
    FOREIGN KEY (Mgr_ssn) REFERENCES EMPLOYEE(Ssn);
CREATE TABLE DEPARTMENT
( Dname          VARCHAR(15)      NOT NULL,
  Dnumber         INT             NOT NULL,
  Mgr_ssn        CHAR(9),
  Mgr_start_date DATE,
  PRIMARY KEY (Dnumber),
  FOREIGN KEY (Dname),
  FOREIGN KEY (Mgr_ssn) REFERENCES EMPLOYEE(Ssn);
CREATE TABLE DEPT_LOCATIONS
( Dnumber         INT             NOT NULL,
  Location        VARCHAR(15)      NOT NULL,
  PRIMARY KEY (Dnumber, Location),
  FOREIGN KEY (Dnumber) REFERENCES DEPARTMENT(Dnumber);
  
```

15

CREATE TABLE PROJECT

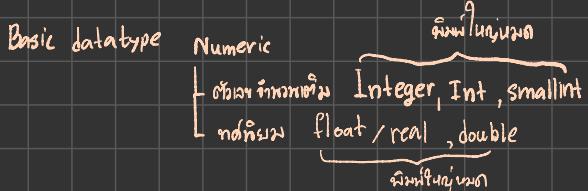
```

( Pname          VARCHAR(15)      NOT NULL,
  Pnumber         INT             NOT NULL,
  Plocation       VARCHAR(15),
  Dnum            INT             NOT NULL,
  PRIMARY KEY (Pnumber),
  UNIQUE (Pname),
  FOREIGN KEY (Dnum) REFERENCES DEPARTMENT(Dnumber);
CREATE TABLE WORKS_ON
( Essn          CHAR(9)          NOT NULL,
  Pno            INT             NOT NULL,
  Hours          DECIMAL(3,1)     NOT NULL,
  PRIMARY KEY (Essn, Pno),
  FOREIGN KEY (Essn) REFERENCES EMPLOYEE(Ssn),
  FOREIGN KEY (Pno) REFERENCES PROJECT(Pnumber);
CREATE TABLE DEPENDENT
( Essn          CHAR(9)          NOT NULL,
  Dependent_name VARCHAR(15)     NOT NULL,
  Sex            CHAR,
  Bdate          DATE,
  Relationship   VARCHAR(8),
  PRIMARY KEY (Essn, Dependent_name),
  FOREIGN KEY (Essn) REFERENCES EMPLOYEE(Ssn);
  
```

Foreign key 1m Error

- refer 1m table 1m table ດີ່ນເລືອດ
- circular references ດີ່ນມານີ້ em(ssn) \rightarrow D(M.ssn) ໃຫ້ m refer 1m
- ກຳໄຕຍ່າງ set Fk ກັນ

Attribute Data Types & Domain



Character-String

Fixed length - ດີ່ນທີ່ນັ້ນຄວາມສະບັບ : CHAR(n), CHARACTER(n)
Varying length - ດີ່ນທີ່ນັ້ນຕະຫຼາດ : VARCHAR(n), CHAR VARYING(n), CHARACTER VARYING

Bit-string

Fixed length : BIT(n)

Vary length : BIT VARYING(n)

Boolean

TRUE, FALSE, NULL

DATE Y/M/D (ວິທີວັນ)

Ten positions

Component no YEAR, MONTH, DAY ອີກິນຝາກ YYYY-MM-DD

Multiple mapping function ຖະແຫຼງ RDBMS

Other

timestamp DATE+TIME

• 6 digits for min

• 10ms TIME ZONE

INTERVAL ທີ່ມ + ອົບໂຕ (sec, msec, timestamp)

Ex: 10:00 AM [10:30 + 30 = late]

[15:30 - 30 = afternoon / 1PM]

* DATE, TIME, Timestamp, INTERVAL ລົງ data type ຮິນໃຊ້
ໃນ "String" ຍົກ ຂໍໃນການເກີດ

Domain ជាបច្ចនិតិវករ

- ដែលបង្កើតឡើង Attribute
- ត្រូវពាក្យលើ data type និង Domain ដូចជានឹង numerous attributes
- Improves schema readability

Ex: CREATE DOMAIN SSN_TYPE AS CHAR(9)

Type : User Define Type (UDT) និង object-oriented

9.8 CREATE TYPE

Constraints

Basic និង type

- key : pk និង fk
- Entity Integrity : pk ត្រូវជានុញ្ញនៃ null
- Referential Integrity : fk ត្រូវជានុញ្ញនៃ pk , ឬនៅ Null នៅលើ

Other on domain

- Default និង Attributed

- DEFAULT <value>
- NULL (និងនូវក្នុង particular Attributed)

- Check clause

Ex: Dnumber INT NOT NULL CHECK
(Dnumber > 0 AND Dnumber < 21)

[
- pk clause | Attribute ↑ និង pk ឬ fk Ex. Dnumber INT PRIMARY KEY;
- UNIQUE clause និង Attribute និង key/secondary key ឬនូវ "candidate key"
Foreign key (FK) clause
Ex. Dname VARCHAR(15) UNIQUE;

• Default operation : reject update on violation ឬនូវក្នុងការសម្រេចការណ៍ទាំងអស់

• Attach referential triggered action clause និងការកំណត់នៃ

- operation include SET NULL , CASCADE , SET DEFAULT
- action នៃ DBMS SET NULL / SET DEFAULT និងនូវ ON DELETE / ON UPDATE
- CASCADE option និង "relationship" relations

ការលក់ Constraints

• ការលក់នឹងយកទៅលក់នៃ table និងបាន pk , fk

keyword - is constraint

- ផ្លាស់ប្តូរការណ៍បានការណ៍សម្រាប់

ការបង្កើត row និង (Tuples)

• និង CHECK និងការងារ CREATE TABLE

- និងត្រូវការងារ tuple និងការងារ
- CHECK (Dept_create_date <= Mgr_start_date)

• និងត្រូវការងារនៃតាមលក្ខណៈ , និងនូវការងារ CPU , ប្រគល់ការងារ