Database Management Essentials

Relational Data Model

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Basics of Relational Databases

- 정의와 구성
  - Relational Database = Collection of Tables
  - Table = Heading (definition part) + Body (content part)
    - Heading = Table Name + Column Names
- Relations
  - Table 간의 연결성
  - 어떻게? Matching Values 한다

Integrity Rules

- Entity Integrity
  - Primary Keys: Unique + No missing value
  - Ensure traceable entities:
    어느 개체에 쉽게 접근할 수 있는 티켓
- Referential Integrity
  - Foreign Keys
  - Valid references among tables:
    제대로 연결되어 있는게 맞는지

Basic SQL `CREATE TABLE` Statement

```
CREATE TABLE <table-name> (
    <column-list>
    <constraint-list>
)
;
```

- Common SQL Data Types
  - CHAR(Max Length): 항상 Max Length만큼을 저장, e.g. 국가코드
  - VARCHAR(Max Length): Max Length 이하의 받는 만큼만 저장
  - INTEGER
  - FLOAT(Precision)
  - DECIMAL(W, R): 정해진 범위가 있는 숫자, e.g. 금액 (W = 전체 숫자의 개수, R = 소수점 이하 자리 수)
  - DATE, TIME, TIMESTAMP vs. DATE (= DATE + TIME): 표준적이지 않다

Integrity Constraint Syntax

```
CREATE TABLE Offering
(
    OfferNo INTEGER,
    CourseNo CHAR(6) CONSTRAINT OffCourseNoReq NOT NULL,
    OffLocation VARCHAR(50),
    OffDays CHAR(6),
    OffTerm CHAR(6) CONSTRAINT OffTermReq NOT NULL,
    OffYear INTEGER CONSTRAINT OffYearReq NOT NULL,
    FacNo CHAR(11),
    OffTime DATE,
    CONSTRAINT PKOffering PRIMARY KEY (OfferNo),
    CONSTRAINT FKCourseNo FOREIGN KEY (CourseNo) REFERENCES Course,
    CONSTRAINT FKFacNo FOREIGN KEY (FacNo) REFERENCES Faculty,
    CONSTRAINT ValidOffTime CHECK (OffTime BETWEEN '2019-01-01' AND '2019-12-31')
);
```

Subjects

- **PRIMARY KEY**
- **FOREIGN KEY**
- **UNIQUE**
- **NOT NULL**
- **CHECK**

Placement

- **Inline: 주로 쓰는 방법, 편하다**
- **External: 여러 column이 연관되는 경우에는 반드시**

Constraint Name

- **Must use for helpful error messages**