



Module 3

Relational Data Model and CREATE TABLE Statement

Lesson 4: Integrity Constraint Syntax



Lesson Objectives

- Read and write CREATE TABLE statements with PK constraints
- Read and write CREATE TABLE statements with FK constraints
- Read and write CREATE TABLE statements with simple CHECK constraints



Constraint Overview

Subject

- Primary key
- Foreign key
- Unique
- Required (NOT NULL)
- Check

Placement

- Inline
- External



Constraint Syntax Examples

- `CONSTRAINT PKCourse PRIMARY KEY (CourseNo)`
- `CONSTRAINT PKErollment PRIMARY KEY (OfferNo, StdNo)`
- `CONSTRAINT UniqueCrsDesc UNIQUE (CrsDesc)`
- `CONSTRAINT FKOfferNo FOREIGN KEY (OfferNo) REFERENCES Offering`
- `CONSTRAINT OffCourseNoReq NOT NULL`



External PK Constraint Placement

```
CREATE TABLE Course
( CourseNo CHAR(6),
  CrsDesc VARCHAR(250),
  CrsUnits SMALLINT,
  CONSTRAINT PKCourse PRIMARY KEY(CourseNo),
  CONSTRAINT UniqueCrsDesc UNIQUE (CrsDesc) )
```



External FK Constraint Placement

```
CREATE TABLE Enrollment
( OfferNo    INTEGER,
  StdNo      CHAR(11),
  EnrGrade   DECIMAL(3,2),
  CONSTRAINT PKErollment PRIMARY KEY
    (OfferNo, StdNo),
  CONSTRAINT FKOfferNo FOREIGN KEY (OfferNo)
    REFERENCES Offering,
  CONSTRAINT FKStdNo FOREIGN KEY (StdNo)
    REFERENCES Student );
```



Inline Constraint Placement

```
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 );
```



Check Constraint Examples

- Syntax: CHECK (<row-condition>)
- Row conditions with columns from the same table

```
CONSTRAINT ValidGPA CHECK ( StdGPA BETWEEN 0 AND 4 )
```

```
CONSTRAINT ValidStdClass  
CHECK ( StdClass IN ('FR','SO', 'JR', 'SR' )
```

```
CONSTRAINT OffYearValid CHECK ( OffYear > 1970 )
```

```
CONSTRAINT EnrollDropValid  
CHECK ( EnrollDate < DropDate )
```



Summary

- Importance of PK and FK constraints
- Use constraint names
- CHECK constraint limitations

