Business School
UNIVERSITY OF COLORADO DENVER

Information Systems Program

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 PKEnrollment 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 PKEnrollment 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
- MySQL syntax limitations