

Definitions - Class 2

...

Constraints, Keys, and Referential Integrity

Constraint

An explicit requirement added to a table column definition that specifies certain properties that data in a database must comply with

```
Create table Class (  
    ID int auto_increment,  
    Name varchar(50) NOT NULL,  
    Description varchar(200),  
    Code varchar(10) UNIQUE,  
    MaximumStudents int DEFAULT 10,  
    primary key (id)  
);
```

Constraints

An explicit requirement added to a table column definition that specifies certain properties that data in a database must comply with

```
Create table Class (  
    ID int auto_increment,  
    Name varchar(50) NOT NULL,  
    Description varchar(200),  
    Code varchar(10) UNIQUE,  
    MaximumStudents int DEFAULT 10,  
    primary key (id)  
);
```

Constraints

An explicit requirement added to a table column definition that specifies certain properties that data in a database must comply with

```
Create table Class (  
    ID int auto_increment,  
    Name varchar(50) NOT NULL,  
    Description varchar(200),  
    Code varchar(10) UNIQUE,  
    MaximumStudents int DEFAULT 10,  
    primary key (id)  
);
```

Constraints

An explicit requirement added to a table column definition that specifies certain properties that data in a database must comply with

```
Create table Class (  
    ID int auto_increment,  
    Name varchar(50) NOT NULL,  
    Description varchar(200),  
    Code varchar(10) UNIQUE,  
    MaximumStudents int DEFAULT 10,  
    primary key (id)  
);
```

Primary Key

Create table Course (

CourseCode varchar(10) NOT NULL,

Description varchar(200),

primary key (CourseCode)

Course

);

CourseCode	CourseDescription
ENG402	Advanced Literature and Composition
ENG101	Introduction to English Literature
CS404	Database Management
CS101	Introduction to Java

Primary Key

Create table Course (

CourseCode varchar(10) NOT NULL,

Description varchar(200),

primary key (CourseCode)

);

Course

CourseCode	CourseDescription
ENG402	Advanced Literature and Composition
ENG101	Introduction to English Literature
CS404	Database Management
CS101	Introduction to Java

Composite Key

```
Create table Course (  
    CourseCode varchar(10) NOT  
    NULL,
```

```
    StartDate date NOT NULL,
```

```
    Description varchar(200),
```

```
    primary key (CourseCode,  
    StartDate)
```

Course

CourseCode	StartDate	CourseDescription
CS101	2017-08-21	Introduction to Java
CS101	2018-08-20	Introduction to Java
CS404	2017-08-21	Database Management
ENG101	2017-08-21	Introduction to English Literature
ENG101	2018-08-20	Introduction to English Literature
ENG402	2017-08-21	Advanced Literature and Composition

Composite Key

Create table Course (

CourseCode varchar(10) NOT NULL,

StartDate date NOT NULL,

Description varchar(200),

primary key (CourseCode, StartDate)

Course

);

CourseCode	StartDate	CourseDescription
CS101	2017-08-21	Introduction to Java
CS101	2018-08-20	Introduction to Java
CS404	2017-08-21	Database Management
ENG101	2017-08-21	Introduction to English Literature
ENG101	2018-08-20	Introduction to English Literature
ENG402	2017-08-21	Advanced Literature and Composition

Primary Key Requirements

- Unique
- Not Null
- Must Exist when the record is created
- Stable (not changing overtime)
- Compact
- Bad examples of Primary key:
 - SSN
 - email


Foreign Key

```
Create table Course (  
    ID int auto_increment,  
    CourseCode varchar(10) NOT  
    NULL,  
    StartDate date NOT NULL,  
    Description varchar(200),  
    primary key (ID)  
);
```

ID	CourseCode	StartDate	CourseDescription
1	ENG101	2017-08-21	Introduction to English Literature
2	ENG402	2017-08-21	Advanced Literature and Composition
3	CS101	2017-08-21	Introduction to Java
4	CS404	2017-08-21	Database Management
5	ENG101	2018-08-20	Introduction to English Literature
6	CS101	2018-08-20	Introduction to Java

Course

Foreign Key



ID	CourseCode	StartDate	CourseDescription
1	ENG101	2017-08-21	Introduction to English Literature
2	ENG402	2017-08-21	Advanced Literature and Composition
3	CS101	2017-08-21	Introduction to Java
4	CS404	2017-08-21	Database Management
5	ENG101	2018-08-20	Introduction to English Literature
6	CS101	2018-08-20	Introduction to Java

Course

InstructorId	CourseID
1	1
127	1
792	2
304	3
49	6

CourseInstructor

Referential Integrity



InstructorId	CourseID
1	1
127	1
792	2
304	3
49	6

CourseInstructor

ID	CourseCode	StartDate	CourseDescription
1	ENG101	2017-08-21	Introduction to English Literature
2	ENG402	2017-08-21	Advanced Literature and Composition
3	CS101	2017-08-21	Introduction to Java
4	CS404	2017-08-21	Database Management
5	ENG101	2018-08-20	Introduction to English Literature
6	CS101	2018-08-20	Introduction to Java

Course

Referential Integrity



InstructorId	CourseId
1	1
127	1
792	2
304	3
49	6
111	12

CourseInstructor

ID	CourseCode	StartDate	CourseDescription
1	ENG101	2017-08-21	Introduction to English Literature
2	ENG402	2017-08-21	Advanced Literature and Composition
3	CS101	2017-08-21	Introduction to Java
4	CS404	2017-08-21	Database Management
5	ENG101	2018-08-20	Introduction to English Literature
6	CS101	2018-08-20	Introduction to Java

Course

?