

SchoolNova



IT102

Foreign Keys

Foreign Keys

- A foreign key is an attribute in a table that is either NULL or must match a value from another table (called Referential Integrity).
- It realizes a relationship between two tables.
- The SQL is
FOREIGN KEY (<column>)
REFERENCES
<table>.<column>
- A foreign key takes its values from another table (its parent in the relationship).
- What happens if the parent value is updated or deleted? How will referential integrity be maintained?

Referential Integrity

- **RESTRICT**: rejects the delete or update operation for the parent table.
- **CASCADE**: make same update to child as made to parent
- **SET NULL**: set the child value to NULL when the parent is updated
- **NO ACTION**: prevent parent from being updated if children are affected (same as RESTRICT in MySQL)

Example

```
CREATE TABLE IF NOT EXISTS COUNTRIES (  
  CID INT NOT NULL AUTO_INCREMENT PRIMARY KEY,  
  COUNTRY_NAME VARCHAR(45),  
  CONTINENT VARCHAR(45),  
  CREATE_TS TIMESTAMP DEFAULT CURRENT_TIMESTAMP)  
ENGINE = InnoDB;
```

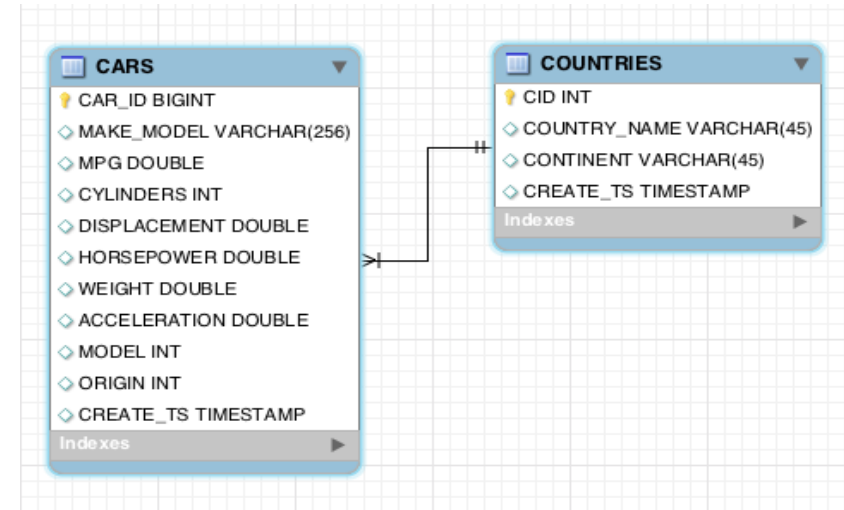
```
DROP TABLE CARS;
```

```
CREATE TABLE IF NOT EXISTS CARS (  
  CAR_ID BIGINT NOT NULL AUTO_INCREMENT PRIMARY KEY,  
  MAKE_MODEL VARCHAR(256),  
  MPG DOUBLE,  
  CYLINDERS INT,  
  DISPLACEMENT DOUBLE,  
  HORSEPOWER DOUBLE,  
  WEIGHT DOUBLE,  
  ACCELERATION DOUBLE,  
  MODEL INT,  
  ORIGIN INT,  
  CREATE_TS TIMESTAMP DEFAULT CURRENT_TIMESTAMP,  
  CONSTRAINT FOREIGN KEY (ORIGIN) REFERENCES COUNTRIES(CID) ON DELETE RESTRICT ON UPDATE RESTRICT)  
ENGINE = InnoDB;
```

```
INSERT INTO COUNTRIES (COUNTRY_NAME, CONTINENT) VALUES ('USA', 'North America'), ('Italy', 'Europe'),  
('Japan', 'Asia');
```

```
INSERT INTO CARS (MAKE_MODEL, MPG, CYLINDERS, DISPLACEMENT, HORSEPOWER, WEIGHT, ACCELERATION, MODEL,  
ORIGIN) VALUES ('Toyota Camry', 20, 4, 97, 88, 2279, 19, 73, (SELECT CID FROM COUNTRIES WHERE COUNTRY_NAME =  
'Japan'));
```

```
DELETE FROM COUNTRIES WHERE COUNTRY_NAME = 'Japan';
```



Homework

- Create three tables:
 - ◆ STUDENTS (SID, SNAME, AGE)
 - ◆ CLASSES (CID, CNAME, ROOM)
 - ◆ ATTENDANCE (A_CID, A_SID, A_DATE)
- The ATTENDANCE table should have two foreign keys, one for STUDENTS, another for CLASSES
- Using the example on previous slide, try to create INSERT statements to add data to your tables.