Database Programming with SQL
14-2: PRIMARY KEY, FOREIGN KEY, and CHECK Constraints Practice Solutions
Vocabulary

Directions: Identify the vocabulary word for each definition below.

ON DELETE CASCADE	Allows a foreign key row that is reference to a primary key row to be deleted
CHECK constraint	Explicitly defines a condition that must be met
PRIMARY KEY constraint	A column or set of columns that uniquely identifies each row in a table
NOT NULL	Constraint ensures that the column contains no null values
ON DELETE SET NULL	Allows a child row to remain in a table with null values when a parent record has been deleted
FOREIGN KEY constraint	Establishes a relationship between the foreign key column and a primary key or unique key in the same table or a different table

Try It / Solve It

1. What is the purpose of a
   - PRIMARY KEY
   - FOREIGN KEY
   - CHECK CONSTRAINT

   Solution:
   1a. To uniquely identify each row in a table.
   1b. To designate a column or combination of columns as a foreign key
   1c. To explicitly define a condition that must be met.

2. Using the column information for the animals table below, name constraints where applicable at the table level, otherwise name them at the column level. Define the primary key (animal_id). The license_tag_number must be unique. The admit_date and vaccination_date columns cannot contain null values.

   animal_id NUMBER(6)
   name VARCHAR2(25)
   license_tag_number NUMBER(10)
   admit_date DATE
   adoption_id NUMBER(5),
   vaccination_date DATE

   Solution:
   To prevent mistakes, students should write this out on paper or in a word-processing program before creating the tables.

   admit_date DATE CONSTRAINT animals_admit_nn NOT NULL,
   vaccination_date DATE CONSTRAINT animals_vacc_nn NOT NULL,
   CONSTRAINT animal_id_pk PRIMARY KEY (animal_id),
   CONSTRAINT lic_tag_num_uk UNIQUE (license_tag_number));

3. Create the animals table. Write the syntax you will use to create the table.

   Solution:
   CREATE TABLE animals (
   animal_id NUMBER(6),
   name VARCHAR2(25),
   license_tag_number NUMBER(10),
   admit_date DATE CONSTRAINT animals_admit_nn NOT NULL,
   adoption_id NUMBER(5),
   vaccination_date DATE CONSTRAINT animals_vacc_nn NOT NULL,
   CONSTRAINT animal_id_pk PRIMARY KEY (animal_id),
   CONSTRAINT lic_tag_num_uk UNIQUE (license_tag_number));

4. Enter one row into the table. Execute a SELECT * statement to verify your input. Refer to the graphic below for input.

ANIMAL_ID	NAME	LICENSE_TAG_NUMBER	ADMIT_DATE	ADOPTION_ID	VACCINATION_DATE
101	Spot	35540	10-OCT-2004	205	12-OCT-2004

Solution:
INSERT INTO animals (animal_id, name, license_tag_number, admit_date, adoption_id, vaccination_date)
VALUES (101, 'Spot', 35540, '10-OCT-2004', 205, '12-OCT-2004');

5. Write the syntax to create a foreign key (adoption_id) in the animals table that has a corresponding primary-key reference in the adoptions table. Show both the column-level and table-level syntax. Note that because you have not actually created an adoptions table, no adoption_id primary key exists, so the foreign key cannot be added to the animals table.

Solution:
Column level: adoption_id NUMBER(5) CONSTRAINT adopt_date_fk REFERENCES adoptions(adoption_id);
Table level: CONSTRAINT adopt_date_fk FOREIGN KEY(adoption_id) REFERENCES adoptions (adoption_id);

6. What is the effect of setting the foreign key in the ANIMAL table as:
   a. ON DELETE CASCADE
   b. ON DELETE SET NULL

Solution:
6a.When the parent record is removed so is the child record.
6b.When the parent record is removed then the foreign key field is set to null.

7. What are the restrictions on defining a CHECK constraint?

Solution:
- A CHECK constraint cannot be used in queries that refer to values in other rows, even in the same table
- The CHECK constraint cannot contain calls to the functions SYSDATE, UID, USER, or USERENV.
- The CHECK constraint cannot use the pseudocolumns CURRVAL, NEXTVAL, LEVEL, or ROWNUM.