Database Programming with SQL

14-2: PRIMARY KEY, FOREIGN KEY, and CHECK Constraints

Practice Activities

Objectives

* Define and give an example of PRIMARY KEY, FOREIGN KEY, and CHECK constraints
* Explain the purpose of defining PRIMARY KEY, FOREIGN KEY, and CHECK constraints on a table
* Demonstrate the creation of constraints at the column level and table level in a CREATE TABLE statement
* Evaluate a business problem requiring the addition of a PRIMARY KEY and FOREIGN KEY constraint and write the code to execute the change

Vocabulary

|  |  |
| --- | --- |
| ON DELETE CASCADE | Allows a foreign key row that is referenced to a  primary key row to be deleted |
| Check Constraint | Explicitly defines a condition that must be met |
| Primary key | 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

a. PRIMARY KEY

identificator unic pt fiecare linie in tabel

b. FOREIGN KEY

referinta catre un alt tabel parinte – informatia din linia corespunzatoare

c. CHECK CONSTRAINT

conditie explicita care tb indeplinita de fiecare dintre campurile randurilor. Returneaza True sau Unknown

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) **primary key**

name VARCHAR2(25)

license\_tag\_number NUMBER(10) **Unique**

admit\_date DATE **not null**

adoption\_id NUMBER(5),

vaccination\_date DATE **not null**

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

**CREATE TABLE  animals**

**( animal\_id  NUMBER(6,0) CONSTRAINT anl\_anl\_id\_pk PRIMARY KEY ,**

**name VARCHAR2(25),**

**license\_tag\_number NUMBER(10,0) CONSTRAINT anl\_l\_tag\_num\_uk UNIQUE,**

**admit\_date  DATE CONSTRAINT anl\_adt\_dat\_nn NOT NULL ENABLE,**

**adoption\_id   NUMBER(5,0),**

**vaccination\_date  DATE CONSTRAINT anl\_vcc\_dat\_nn NOT NULL ENABLE**

**)**

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 |

**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.

**ALTER TABLE animals**

**MODIFY ( adoption\_id   NUMBER(5,0) CONSTRAINT anl\_adopt\_id\_fk  REFERENCES adoptions(id) ENABLE );**

sau cu table level statement:

**ALTER TABLE  animals ADD CONSTRAINT anl\_adopt\_id\_fk  FOREIGN KEY (adoption\_id)**

**REFERENCES  adoptions(id) ENABLE;**

6. What is the effect of setting the foreign key in the ANIMAL table as:

a. ON DELETE CASCADE

**ALTER TABLE  animals**

**ADD CONSTRAINT anl\_adopt\_id\_fk  FOREIGN KEY (adoption\_id)**

**REFERENCES  adoptions (id) ENABLE ;**

Assume, adoptions  has a row with id 500 and this row is referenced in animals. If I try:

DELETE FROM adoptions WHERE id= 500;

I will get error:

**ORA-02292: integrity constraint (HKUMAR.ANL\_ADOPT\_ID\_FK) violated - child record found**

b. ON DELETE SET NULL

ALTER TABLE animals

DROP CONSTRAINT anl\_adopt\_id\_fk  ;

**ALTER TABLE  animals**

**ADD CONSTRAINT anl\_adopt\_id\_fk  FOREIGN KEY (adoption\_id)**

**REFERENCES  adoptions(id) ON DELETE SET NULL  ENABLE ;**

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

