 



# Database Programming with SQL

* 1. : 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

Identify the vocabulary word for each definition below.

|  |  |
| --- | --- |
| REFERNCES | Allows a foreign key row that is referenced to a primary key row to be deleted |
| CHECK Constraint Conditions | 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
   1. PRIMARY KEY

-asigura ca valorile din coloana respectiva sa fie unice

* 1. FOREIGN KEY

-stabileste o relatie intre coloana si coloana din tabela de referinta

* 1. CHECK CONSTRAINT

-defineste o conditie care trebuie sa fie indeplinita

1. 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 CONSTRAINTS admit\_date\_nn NOT NULL,

adoption\_id NUMBER(5),

vaccination\_date DATE CONSTRAINTS vaccination\_date\_nn NOT NULL,

CONSTRAINT animal\_id\_pk PRIMARY KEY (animal\_id),

CONSTRAINT license\_tag\_number\_uk UNIQUE (license\_tag\_number);

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

CREATE TABLE animals(

animal\_id NUMBER(6),

name VARCHAR2(25),

license\_tag\_number NUMBER(10),

admit\_date DATE CONSTRAINTS admit\_date\_nn NOT NULL,

adoption\_id NUMBER(5),

vaccination\_date DATE CONSTRAINTS vaccination\_date\_nn NOT NULL,

CONSTRAINT animal\_id\_pk PRIMARY KEY (animal\_id),

CONSTRAINT license\_tag\_number\_uk UNIQUE (license\_tag\_number));

1. 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, TO\_DATE('10-Oct-2004','fmDD-Month-yyyy'), 205, TO\_DATE('12-Oct-2004','fmDD-Month-yyyy'))

SELECT \*

FROM animals

1. 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.

CREATE TABLE adoptions

(id\_adoptions NUMBER(3) CONSTRAINT id\_adoptions\_pk PRIMARY KEY);

CREATE TABLE animals(

animal\_id NUMBER(6),

name VARCHAR2(25),

license\_tag\_number NUMBER(10),

admit\_date DATE CONSTRAINTS admit\_date\_nn NOT NULL,

adoption\_id NUMBER(5,0) CONSTRAINTS adoption\_id\_fk

REFERENCES adoptions(id\_adoptions),

vaccination\_date DATE CONSTRAINTS vaccination\_date\_nn NOT NULL,

CONSTRAINT animal\_id\_pk PRIMARY KEY (animal\_id),

CONSTRAINT license\_tag\_number\_uk UNIQUE (license\_tag\_number));

CREATE TABLE animals(

animal\_id NUMBER(6),

name VARCHAR2(25),

license\_tag\_number NUMBER(10),

admit\_date DATE CONSTRAINTS admit\_date\_nn NOT NULL,

adoption\_id NUMBER(5),

vaccination\_date DATE CONSTRAINTS vaccination\_date\_nn NOT NULL,

CONSTRAINT animal\_id\_pk PRIMARY KEY (animal\_id),

CONSTRAINT license\_tag\_number\_uk UNIQUE (license\_tag\_number),

CONSTRAINT adoption\_id\_fk FOREIGN KEY(adoption\_id)

REFERENCES adoptions(id\_adoptions));

1. What is the effect of setting the foreign key in the ANIMAL table as:
   1. ON DELETE CASCADE

-permite stergerea liniilor din tabelul copil la care se refera tabelul parinte

CREATE TABLE animals(

animal\_id NUMBER(6),

name VARCHAR2(25),

license\_tag\_number NUMBER(10),

admit\_date DATE CONSTRAINTS admit\_date\_nn NOT NULL,

adoption\_id NUMBER(5),

vaccination\_date DATE CONSTRAINTS vaccination\_date\_nn NOT NULL,

CONSTRAINT animal\_id\_pk PRIMARY KEY (animal\_id),

CONSTRAINT license\_tag\_number\_uk UNIQUE (license\_tag\_number),

CONSTRAINT adoption\_id\_fk FOREIGN KEY(adoption\_id)

REFERENCES adoptions(id\_adoptions) ON DELETE CASCADE);

* 1. ON DELETE SET NULL

-permite ramanerea in tabelul copil a unei linii cu valori nule chiar daca aceasta a fost stearsa din tabelul parinte

CREATE TABLE animals(

animal\_id NUMBER(6),

name VARCHAR2(25),

license\_tag\_number NUMBER(10),

admit\_date DATE CONSTRAINTS admit\_date\_nn NOT NULL,

adoption\_id NUMBER(5),

vaccination\_date DATE CONSTRAINTS vaccination\_date\_nn NOT NULL,

CONSTRAINT animal\_id\_pk PRIMARY KEY (animal\_id),

CONSTRAINT license\_tag\_number\_uk UNIQUE (license\_tag\_number),

CONSTRAINT adoption\_id\_fk FOREIGN KEY(adoption\_id)

REFERENCES adoptions(id\_adoptions) ON DELETE SET NULL);

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

Check constraint trebuie sa fie pe linia unde este si constrangerea,

nu poate contine apeluri ale unor fct ca SYSDATE, UID, USER, USERNV,

nu poate contine pseudocoloane CURVAL, NEXTVAL, LEVEL, ROWNUM

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