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

Identify the vocabulary word for each definition below.

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 Uniquely identify each row in table.
   b. FOREIGN KEY Referential integrity constraint links back parent table's primary/unique key to child table's column.
   c. CHECK CONSTRAINT Explicitly define condition to be met by each row's fields. This condition must be returned as true or unknown.

7.· · I cannot specify check constraint for a view however in this case I could use WITH CHECK OPTION clause
· I am restricted to columns from self table and fields in self row.
· I cannot use subqueries and scalar subquery expressions.
· I cannot call functions that are not deterministic e.g. CURRENT_DATE, CURRENT_TIMESTAMP, DBTIMEZONE, LOCALTIMESTAMP, SESSIONTIMEZONE, SYSDATE, SYSTIMESTAMP, UID, USER, and USERENV
I cannot call user defined functions
· I cannot dereference a REF column e.g. using the DEREF function
· Nested table columns or attributes are not allowed
· pseudocolumns CURRVAL, NEXTVAL, LEVEL, or ROWNUM are not allowe

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.

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

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.

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

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

4.
```
INSERT INTO animals (animal_id, name, license_tag_number, admit_date,
adoption_id, vaccination_date)
VALUES( 101, 'Spot', 35540, TO_DATE('10-Oct-2004', 'DD-Mon-YYYY'), 205,
TO_DATE('12-Oct-2004', 'DD-Mon-YYYY'));
SELECT * FROM animals;
```

3.
```
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
);
```

```
DESCRIBE animals;
SELECT *
FROM user_constraints
WHERE LOWER(table_name) = 'animals';
```

5.
```
ALTER TABLE animals
MODIFY ( adoption_id   NUMBER(5,0) CONSTRAINT
anl_adopt_id_fk  REFERENCES adoptions(id)
ENABLE );
ALTER TABLE  animals ADD CONSTRAINT
anl_adopt_id_fk  FOREIGN KEY (adoption_id)
        REFERENCES  adoptions(id) ENABLE;
```

6.
```
ALTER TABLE  animals
ADD CONSTRAINT anl_adopt_id_fk  FOREIGN KEY
(adoption_id)
        REFERENCES  adoptions (id) ENABLE ;
```