

EXERCISE 12

Intro to Constraints; NOT NULL and UNIQUE Constraints

Global Fast Foods has been very successful this past year and has opened several new stores. They need to add a table to their database to store information about each of their store's locations. The owners want to make sure that all entries have an identification number, date opened, address, and city and that no other entry in the table can have the same email address. Based on this information, answer the following questions about the global_locations table. Use the table for your answers.

| Global Fast Foods global_locations Table | | | | | | |
|--|------|--------|-----------|-------|----------|---------|
| NAME | TYPE | LENGTH | PRECISION | SCALE | NULLABLE | DEFAULT |
| id | | | | | | |
| name | | | | | | |
| date_opened | | | | | | |
| address | | | | | | |
| city | | | | | | |
| zip/postal code | | | | | | |
| phone | | | | | | |
| email | | | | | | |
| manager_id | | | | | | |
| Emergency contact | | | | | | |

1. What is a "constraint" as it relates to data integrity?

A constraint is a rule enforced on data in a database to maintain data integrity and accuracy. It ensures that only valid data is entered.

2. What are the limitations of constraints that may be applied at the column level and at the table level?

Column level constraints can only be applied to a single column
 Table level constraints can refer to multiple columns together

3. Why is it important to give meaningful names to constraints?

→ Identify the purpose of the constraint easily.
 → simplify debugging or when an error message references
 → maintain clarity in large databases.

4. Based on the information provided by the owners, choose a datatype for each column. Indicate the length, precision, and scale for each NUMBER datatype.

id NUMBER 4 date_opened DATE
 name VARCHAR2 20 manager_id NUMBER
 city VARCHAR2 20

5. Use "(nullable)" to indicate those columns that can have null values.

zip/postal code (nullable)

phone (nullable)

manager_id (nullable)

Emergency contact (nullable)

6. Write the CREATE TABLE statement for the Global Fast Foods locations table to define the constraints at the column level.

```
CREATE TABLE global_locations ( id NUMBER(4) PRIMARY KEY, name VARCHAR2(20)
NOT NULL, date-opened DATE NOT NULL, address VARCHAR2(30) NOT NULL, city VARCHAR2(20)
NOT NULL, zip_postal VARCHAR2(20), phone VARCHAR(15), email VARCHAR2(80)
UNIQUE NOT NULL, manager_id NUMBER(4), contact VARCHAR2(40));
```

7. Execute the CREATE TABLE statement in Oracle Application Express.

You would run the above SQL code in SQL commands or SQL Workshop inside Oracle APEX.

8. Execute a DESCRIBE command to view the Table Summary information.

```
DESC global_locations;
```

9. Rewrite the CREATE TABLE statement for the Global Fast Foods locations table to define the UNIQUE constraints at the table level. Do not execute this statement.

| NAME | TYPE | LENGTH | PRECISION | SCALE | NULLABLE | DEFAULT |
|------------|----------|--------|-----------|-------|----------|---------|
| id | number | 4 | | | | |
| loc_name | varchar2 | 20 | | | X | |
| | date | | | | | |
| address | varchar2 | 30 | | | | |
| city | varchar2 | 20 | | | | |
| zip_postal | varchar2 | 20 | | | X | |
| phone | varchar2 | 15 | | | X | |
| email | varchar2 | 80 | | | X | |
| manager_id | number | 4 | | | X | |
| contact | varchar2 | 40 | | | X | |

```
CREATE TABLE global_locations ( id NUMBER(4), name VARCHAR(20)
NOT NULL, date-opened DATE NOT NULL, address VARCHAR(30) NOT
NULL, city VARCHAR(20) NOT NULL, zip_postal VARCHAR(20),
phone VARCHAR(15), email VARCHAR(80) NOT NULL, manager id
NUMBER(4), contact VARCHAR2(40), CONSTRAINT pk-global-locations-id
PRIMARY KEY (id), CONSTRAINT uq-global-locations-email UNIQUE
(email));
```


PRIMARY KEY, FOREIGN KEY, and CHECK Constraints

1. What is the purpose of a

- PRIMARY KEY → Uniquely identifies record
- FOREIGN KEY → Links tables
- CHECK CONSTRAINT → Restricts valid data

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

animal_id → PRIMARY KEY

license_tag_number → UNIQUE

admit_date and
vaccination_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) CONSTRAINT pk_animal  
PRIMARY KEY, name VARCHAR(25), license_tag_number NUMBER(10)  
CONSTRAINT uk_license UNIQUE, admit_date DATE CONSTRAINT m_admit_date  
NOT NULL, adoption_id NUMBER(5), vaccination_date DATE
```

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');  
SELECT * FROM animals;
```

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.

```
CREATE TABLE animals ( animal_id NUMBER(6) PRIMARY KEY,  
name VARCHAR(25), license_tag_number NUMBER(10) UNIQUE,  
admit_date DATE NOT NULL, adoption_id NUMBER(5) REFERENCE  
adoptions (adoption_id), vaccination_date DATE NOT NULL);
```

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

- a. ON DELETE CASCADE Deletes related child rows automatically.
- b. ON DELETE SET NULL sets foreign key values in child rows to NULL

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

- 1) CHECK constraint can only refer to columns within the same table — it cannot reference columns in other tables.
- 2) It cannot include subqueries.
- 3) It must be a boolean expression that evaluates to TRUE or FALSE
 - A) It cannot use functions that return non-deterministic values (like SYSDATE, USER, or random values)
- 5) Multiple CHECK constraints can exist on the same table, but each must have a unique name.

| Evaluation Procedure | Marks awarded |
|----------------------|---------------|
| Query(5) | |
| Execution (5) | |
| Viva(5) | |
| Total (15) | |
| Faculty Signature | |