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 that restricts the values in table columns to ensure the accuracy and reliability (integrity) of the data.

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

Column - level: Can only be applied to single column.
Table-Level: Must be used when a constraint applies to two or more columns (composite key).

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

Meaningful names make it easier to identify and troubleshoot errors when a constraint is violated.

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.

Since no specific column names or owners information are provided, you should choose datatypes based on that.

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

Create Table global_locations (id Number(4) NOT NULL, name varchar(20), date_opened date NOT NULL, address varchar2(30) NOT Null, city varchar2(20) No NULL, "zip/postal code" varchar2(20), Phone varchar(15), email varchar2(30) UNIQUE, manager_id Number(4), "emergency contact" varchar2(40));

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

constraint glo-email_uq UNIQUE (email);

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

Same as no above create table

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

Desc Table;

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	30			X	
manager_id	number	4			X	
contact	varchar2	40			X	

PRIMARY KEY, FOREIGN KEY, and CHECK Constraints

1. What is the purpose of a
   - PRIMARY KEY - uniquely identifies each row
   - FOREIGN KEY - Link two tables and enforces data consistency.
   - CHECK CONSTRAINT - Defines a condition that all rows must satisfy

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

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

Create Table animals (animal_id Number (6) constraint animals_pk primary key, name Varchar2(25), license_tag_numbe number (10) constraint animals_lic_uq unique, admit_date date constraint animals_admit_nn adoption_id Number (5), vaccination_date date constraint animals_vacc_nn not NULL);

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_In, 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 ADD (adoption id number(5) constraint animals adopt fk foreign reference 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

a. Deleting parent row automatically deletes all dependent child rows.

b. Deleting a parent row automatically sets the foreign key column to NULL in all dependent child rows.

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

Check constraints cannot reference values from other rows, other tables, Sequences, Sysdate, or the non-deterministic functions. ✓

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

PRACTICE PROBLEM
Managing Constraints

Using Oracle Application Express, click the SQL Workshop tab in the menu bar. Click the Object Browser and verify that you have a table named copy_d_clients and a table named copy_d_events. If you don't have these tables in your schema, create them before completing the exercises below. Here is how the original tables are related. The d_clients table has a primary key client_number. This has a primary-key constraint and it is referenced in the foreign-key constraint on the d_events table.

NOTE: The practice exercises use the d_clients and d_events tables in the DJs on Demand database. Students will work with copies of these two tables named copy_d_clients and copy_d_events. Make sure they have new copies of the tables (without changes made from previous exercises). Remember, tables copied using a subquery do not have the integrity constraints as established in the original tables. When using the SELECT statement to view the constraint name, the tablenames must be all capital letters.

1. What are four functions that an ALTER statement can perform on constraints?

The four functions are ADD, DROP, Disable, and enable a constraint.

2. Since the tables are copies of the original tables, the integrity rules are not passed onto the new tables; only the column datatype definitions remain. You will need to add a PRIMARY KEY constraint to the copy_d_clients table. Name the primary key copy_d_clients_pk . What is the syntax you used to create the PRIMARY KEY constraint to the copy_d_clients.table?

alter table copy-d-clients add constraint copy-d-clients-pk primary key (client-number);

3. Create a FOREIGN KEY constraint in the copy_d_events table. Name the foreign key copy_d_events_fk. This key references the copy_d_clients table client_number column. What is the syntax you used to create the FOREIGN KEY constraint in the copy_d_events table?

Alter Table copy-d-events add constraint copy-d-events-fk foreign key (client number) References copy-d-clients (client_number);

3. Use a SELECT statement to verify the constraint names for each of the tables. Note that the tablenames must be capitalized.

The primary key constraint name in copy_d_clients is copy_d_clients_pk

4. The constraint name for the primary key in the copy_d_clients table is ______________.

The drop constraint statement will fail because the copy_d_events_fk foreign key depends on the copy_d_clients_pk primary key

5. Drop the PRIMARY KEY constraint on the copy_d_clients table. Explain your results.

The drop constraint statement will fail because the copy_d_events_fk foreign key depends on the copy_d_clients_pk primary key

6. Add the following event to the copy_d_events table. Explain your results.

ID	NAME	EVENT_DATE	DESCRIPTION	COST	VENUE_ID	PACKAGE_CODE	THEME_CODE	CLIENT_NUMBER
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7125

The insert statement will fail due to a foreign key violation

7. Create an ALTER TABLE query to disable the primary key in the copy_d_clients table. Then add the values from #6 to the copy_d_events table. Explain your results.

alter table copy_d_events DISABLE constraint copy_d_events_fk;

8. Repeat question 6: Insert the new values in the copy_d_events table. Explain your results.

alter table copy_d_clients disable constraint copy_d_clients_pk;

9. Enable the primary key constraint in the copy_d_clients table. Explain your results.

alter table copy_d_clients enable constraint copy_d_clients_pk;

10. If you wanted to enable the foreign key column and constraint in the relationship between these two tables, what must be done?

you must delete or update to invalid row(s) client 1120 in copy_d_events before you can successfully re-create the foreign key constraint.

11. Why might you want to disable and then re-enable a constraint?

To improve performance when loading large amounts of data. Constraints are disabled during the load and re-enabled afterward to validate the new data.

12. Query the data dictionary for some of the constraints that you have created. How does the data dictionary identify each constraint type?

The user_constraints view identifies constraints by constraint_type:

- P for primary key.
- R for foreign key
- U for unique key
- C for check constraint (includes NOT NULL).

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