

Database Programming with SQL

* 1. : Intro to Constraints; NOT NULL and UNIQUE Constraints Practice Activities

# Objectives

* + - Define the term "constraint" as it relates to data integrity
    - State when it is possible to define a constraint at the column level, and when it is possible at the table level
    - State why it is important to give meaningful names to constraints
    - State which data integrity rules are enforced by NOT NULL and UNIQUE constraints
    - Write a CREATE TABLE statement which includes NOT NULL and UNIQUE constraints at the table and column levels
    - Explain how constraints are created at the time of table creation

# Vocabulary

Identify the vocabulary word for each definition below.

|  |  |
| --- | --- |
| **UNIQUE Constraint** | Every value in a column or set of columns (a composite key) must be unique |
| **NOT NULL Constraint** | For every row entered into the table, there must be a value for that column |
| **PRIMARY KEY** | Constraint ensures that the column contains no null values and uniquely identifies each row of the table |
| **CHECK Constraint** | Specifies a condition for a column that must be true for each row of data |
| **REFERENCES** | Identifies that table and column in the parent table |
| **UNIQUE Constraint** | An integrity constraint that requires every value in a column or set of columns be unique |
| **FOREIGN KEY** | Designates a column (child table) that establishes a relationship between a primary key in the same table and a different table (parent table) |
| **Table Level Constraint** | References one or more columns and is defined separately from the definitions of the columns in the table |
| **Constraint** | Database rule. |
| **Column Level Constraint** | Database rule that references a single column |

# Try It / Solve It

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 | pk |  |  |  | No |  |
| name |  |  |  |  |  |  |
| date\_opened |  |  |  |  | No |  |
| address |  |  |  |  | No |  |
| city |  |  |  |  | No |  |
| zip/postal code |  |  |  |  |  |  |
| phone |  |  |  |  |  |  |
| email | uk |  |  |  |  |  |
| manager\_id |  |  |  |  |  |  |
| Emergency contact |  |  |  |  |  |  |

TYPE is key type

Nullable targets optionality

**pk** – primary key,**uk**-Unique key, fk- foreign key

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

**Database can be as reliable as the data in it, and database rules are implemented as Constraint to maintain data integrity. For example these constraints may prohibit deletion of a table or some row when insertion, updation or deletion is executed. Type of constraints:**

·         **PRIMARY KEY Constraint**

·         **UNIQUE Constraint**

·         **FOREIGN KEY Constraint**

·         **CHECK Constraint with condition applied on the column/columns (they work at row level)**

·         **NOT NULL Constraint (implemented at row level using special CHECK Constraint having condition IS NOT NULL for single column)**

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

**Constraints referring to more than one column are defined at Table Level**

·         **NOT NULL constraint must be defined at column level as per ANSI/ISO SQL standard.**

·         **If word CONSTRAINT is used in a CREATE TABLE statement, I must specify constraint name. Also, that is why, Table level constraint must be user-named.**

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

**If a constraint is violated in a SQL statement execution, it is easy to identify the cause with user-named constraints.**

·         **It is easy to alter names/drop constraint.**

·         **Handling production issues may be faster with user-named constraints**

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Global Fast Foods global\_locations Table** | | | | | | | |
| NAME | | TYPE | DataType | LENGTH | PRECISION | SCALE | NULLABLE | DEFAULT |
| Id | | pk | **NUMBER** | 6 | 0 |  | No |  |
| name | |  | **VARCHAR2** | 50 |  |  |  |  |
| date\_opened | |  | **DATE** |  |  |  | No |  |
| address | |  | **VARCHAR2** | 50 |  |  | No |  |
| city | |  | **VARCHAR2** | 30 |  |  | No |  |
| zip/postal code | |  | **VARCHAR2** | 12 |  |  |  |  |
| phone | |  | **VARCHAR2** | 20 |  |  |  |  |
| email | | uk | **VARCHAR2** | 75 |  |  |  |  |
| manager\_id | |  | **NUMBER** | 6 | 0 |  |  |  |
| Emergency contact | |  | **VARCHAR2** | 20 |  |  |  |  |

1. Use “nullable” to indicate those columns that can have null values.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Global Fast Foods global\_locations Table** | | | | | | | |
| NAME | | TYPE | DataType | LENGTH | PRECISION | SCALE | NULLABLE | DEFAULT |
| Id | | pk | **NUMBER** | 6 | 0 |  | No |  |
| name | |  | **VARCHAR2** | 50 |  |  | **Yes** |  |
| date\_opened | |  | **DATE** |  |  |  | No |  |
| address | |  | **VARCHAR2** | 50 |  |  | No |  |
| city | |  | **VARCHAR2** | 30 |  |  | No |  |
| zip/postal code | |  | **VARCHAR2** | 12 |  |  | **Yes** |  |
| phone | |  | **VARCHAR2** | 20 |  |  | **Yes** |  |
| email | | uk | **VARCHAR2** | 75 |  |  | **Yes** |  |
| manager\_id | |  | **NUMBER** | 6 | 0 |  | **Yes** |  |
| Emergency contact | |  | **VARCHAR2** | 20 |  |  | **Yes** |  |

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

**CREATE TABLE  f\_global\_locations**

**( id NUMBER(6,0) CONSTRAINT f\_gln\_id\_pk PRIMARY KEY ,**

**name VARCHAR2(50),**

**date\_opened DATE CONSTRAINT f\_gln\_dt\_opened\_nn NOT NULL ENABLE,**

**address VARCHAR2(50) CONSTRAINT f\_gln\_add\_nn NOT NULL ENABLE,**

**city VARCHAR2(30)  CONSTRAINT f\_gln\_city\_nn NOT NULL ENABLE,**

**zip\_postal\_code VARCHAR2(12),**

**phone VARCHAR2(20),**

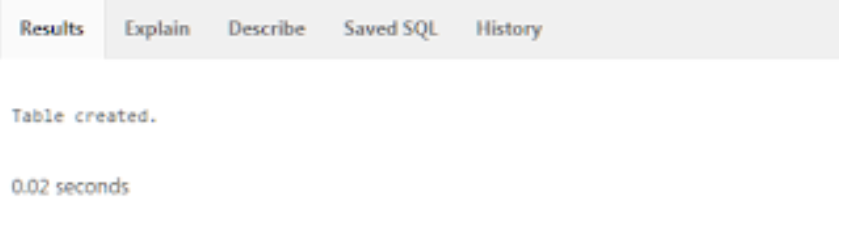
**email VARCHAR2(75) CONSTRAINT f\_gln\_email\_uk UNIQUE,**

**manager\_id NUMBER(6,0),**

**emergency\_contact VARCHAR2(20)**

**);**

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



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

**DESCRIBE f\_global\_locations;**

1. 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.

CREATE TABLE  f\_global\_locations

( id NUMBER(6,0) CONSTRAINT f\_gln\_id\_pk PRIMARY KEY ,

name VARCHAR2(50),

date\_opened DATE CONSTRAINT f\_gln\_dt\_opened\_nn NOT NULL ENABLE,

address VARCHAR2(50) CONSTRAINT f\_gln\_add\_nn NOT NULL ENABLE,

city VARCHAR2(30)  CONSTRAINT f\_gln\_city\_nn NOT NULL ENABLE,

zip\_postal\_code VARCHAR2(12),

phone VARCHAR2(20),

**email VARCHAR2(75) ,**

manager\_id NUMBER(6,0),

emergency\_contact VARCHAR2(20),

**CONSTRAINT f\_gln\_email\_uk UNIQUE(email)**

);

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