# **SQL PRIMARY KEY Constraint**

## **SQL PRIMARY KEY Constraint**

The PRIMARY KEY constraint uniquely identifies each record in a table.

Primary keys must contain UNIQUE values, and cannot contain NULL values.

A table can have only ONE primary key; and in the table, this primary key can consist of single or multiple columns (fields).

## **SQL PRIMARY KEY on CREATE TABLE**

The following SQL creates a PRIMARY KEY on the "ID" column when the "Persons" table is created:

# CREATE TABLE Persons (     ID int NOT NULL PRIMARY KEY,     LastName varchar(255) NOT NULL,     FirstName varchar(255),     Age int );

To allow naming of a PRIMARY KEY constraint, and for defining a PRIMARY KEY constraint on multiple columns, use the following SQL syntax:

CREATE TABLE Persons (  
    ID int NOT NULL,  
    LastName varchar(255) NOT NULL,  
    FirstName varchar(255),  
    Age int,  
    CONSTRAINT PK\_Person PRIMARY KEY (ID,LastName)  
);

In the example above there is only ONE PRIMARY KEY (PK\_Person). However, the VALUE of the primary key is made up of TWO COLUMNS (ID + LastName).

## **SQL PRIMARY KEY on ALTER TABLE**

To create a PRIMARY KEY constraint on the "ID" column when the table is already created, use the following SQL:

ALTER TABLE Persons  
ADD PRIMARY KEY (ID);

To allow naming of a PRIMARY KEY constraint, and for defining a PRIMARY KEY constraint on multiple columns, use the following SQL syntax:

ALTER TABLE Persons  
ADD CONSTRAINT PK\_Person PRIMARY KEY (ID,LastName);

If you use ALTER TABLE to add a primary key, the primary key column(s) must have been declared to not contain NULL values (when the table was first created).

## **DROP a PRIMARY KEY Constraint**

To drop a PRIMARY KEY constraint, use the following SQL:

ALTER TABLE Persons  
DROP CONSTRAINT PK\_Person;

# **SQL FOREIGN KEY Constraint**

## **SQL FOREIGN KEY Constraint**

The FOREIGN KEY constraint is used to prevent actions that would destroy links between tables.

A FOREIGN KEY is a field (or collection of fields) in one table, that refers to the [PRIMARY KEY](https://www.w3schools.com/sql/sql_primarykey.asp) in another table.

The table with the foreign key is called the child table, and the table with the primary key is called the referenced or parent table.

Look at the following two tables:

Persons Table

|  |  |  |  |
| --- | --- | --- | --- |
| **PersonID** | **LastName** | **FirstName** | **Age** |
| 1 | Hansen | Ola | 30 |
| 2 | Svendson | Tove | 23 |
| 3 | Pettersen | Kari | 20 |

Orders Table

|  |  |  |
| --- | --- | --- |
| **OrderID** | **OrderNumber** | **PersonID** |
| 1 | 77895 | 3 |
| 2 | 44678 | 3 |
| 3 | 22456 | 2 |
| 4 | 24562 | 1 |

Notice that the "PersonID" column in the "Orders" table points to the "PersonID" column in the "Persons" table.

The "PersonID" column in the "Persons" table is the PRIMARY KEY in the "Persons" table.

The "PersonID" column in the "Orders" table is a FOREIGN KEY in the "Orders" table.

The FOREIGN KEY constraint prevents invalid data from being inserted into the foreign key column, because it has to be one of the values contained in the parent table.

## **SQL FOREIGN KEY on CREATE TABLE**

The following SQL creates a FOREIGN KEY on the "PersonID" column when the "Orders" table is created:

CREATE TABLE Orders (  
    OrderID int NOT NULL PRIMARY KEY,  
    OrderNumber int NOT NULL,  
    PersonID int FOREIGN KEY REFERENCES Persons(PersonID)  
);

To allow naming of a FOREIGN KEY constraint, and for defining a FOREIGN KEY constraint on multiple columns, use the following SQL syntax:

CREATE TABLE Orders (  
    OrderID int NOT NULL,  
    OrderNumber int NOT NULL,  
    PersonID int,  
    PRIMARY KEY (OrderID),  
    CONSTRAINT FK\_PersonOrder FOREIGN KEY (PersonID)  
    REFERENCES Persons(PersonID)  
);

## **SQL FOREIGN KEY on ALTER TABLE**

ALTER TABLE Orders  
ADD FOREIGN KEY (PersonID) REFERENCES Persons(PersonID);

ALTER TABLE Orders  
ADD CONSTRAINT FK\_PersonOrder  
FOREIGN KEY (PersonID) REFERENCES Persons(PersonID);

## **DROP a FOREIGN KEY Constraint**

To drop a FOREIGN KEY constraint, use the following SQL:

ALTER TABLE Orders  
DROP CONSTRAINT FK\_PersonOrder;