

# Introduction to constraints in SQL



# SQL constraints

The following constraints are commonly used in SQL:

- NOT NULL - Ensures that a column cannot have a NULL value
- UNIQUE - Ensures that all values in a column are different
- PRIMARY KEY - A combination of a **NOT NULL** and **UNIQUE**. Uniquely identifies each row in a table
- FOREIGN KEY - Prevents actions that would destroy links between tables
- CHECK - Ensures that the values in a column satisfies a specific condition
- DEFAULT - Sets a default value for a column if no value is specified

# Not Null constraint

- **NOT NULL on CREATE TABLE**

Example:

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

- **NOT NULL on ALTER TABLE**

Example:

```
ALTER TABLE Persons  
ALTER Age int NOT NULL;
```

# Unique constraint on create

- **SQL Server / Oracle / MS Access:**

Example:

```
CREATE TABLE Persons (  
    ID int NOT NULL UNIQUE,  
    LastName varchar(255) NOT NULL,  
    FirstName varchar(255),  
    Age int  
);
```

- **MySQL:**

Example:

```
CREATE TABLE Persons (  
    ID int NOT NULL,  
    LastName varchar(255) NOT NULL,  
    FirstName varchar(255),  
    Age int,  
    UNIQUE (ID)  
);
```

- **MySQL / SQL Server / Oracle / MS Access: (on multiple columns)**

Example:

```
CREATE TABLE Persons (  
    ID int NOT NULL,  
    LastName varchar(255) NOT NULL,  
    FirstName varchar(255),  
    Age int,  
    CONSTRAINT UC_Person UNIQUE (ID,LastName)  
);
```

# Unique constraint on alter and drop

- *MySQL / SQL Server / Oracle / MS Access:*

Example:

```
ALTER TABLE Persons  
ADD UNIQUE (ID);
```

- *MySQL / SQL Server / Oracle / MS Access:*

Example: (on multiple columns)

```
ALTER TABLE Persons  
ADD CONSTRAINT UC_Person UNIQUE (ID,LastName);
```

- *MySQL:*

Example:

```
ALTER TABLE Persons  
DROP INDEX UC_Person;
```

- *SQL Server / Oracle / MS Access:*

Example:

```
ALTER TABLE Persons  
DROP CONSTRAINT UC_Person;
```

# Primary key on create

- **MySQL:**

Example:

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

- **SQL Server / Oracle / MS Access:**

Example:

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

- **MySQL / SQL Server / Oracle / MS Access: (on multiple columns)**

Example:

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

# Primary key on alter

- *MySQL / SQL Server / Oracle / MS Access:*

ALTER TABLE Persons

ADD PRIMARY KEY (ID);

- *MySQL / SQL Server / Oracle / MS Access: (on multiple Columns)*

ALTER TABLE Persons

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

# Primary key drop

- *MySQL:*

ALTER TABLE Persons

DROP PRIMARY KEY;

- *SQL Server / Oracle / MS Access:*

ALTER TABLE Persons

DROP CONSTRAINT PK\_Person;



# Foreign key

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

# Foreign key on create

- *MySQL:*

Example:

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

- *SQL Server / Oracle / MS Access:*

Example:

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

# Foreign key on alter

- *MySQL / SQL Server / Oracle / MS Access:*

ALTER TABLE Orders

ADD FOREIGN KEY (PersonID) REFERENCES Persons(PersonID);

- *MySQL / SQL Server / Oracle / MS Access:*

ALTER TABLE Orders

ADD CONSTRAINT FK\_PersonOrder

FOREIGN KEY (PersonID) REFERENCES Persons(PersonID);

# Foreign key drop

- *MySQL / SQL Server / Oracle / MS Access:*

```
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)  
);
```

- *MySQL:*

```
ALTER TABLE Orders  
DROP FOREIGN KEY FK_PersonOrder;
```

- *SQL Server / Oracle / MS Access:*

```
ALTER TABLE Orders  
DROP CONSTRAINT FK_PersonOrder;
```

# Default constraint on create

- *My SQL / SQL Server / Oracle / MS Access:*

```
CREATE TABLE Persons (  
    ID int NOT NULL,  
    LastName varchar(255) NOT NULL,  
    FirstName varchar(255),  
    Age int,  
    City varchar(255) DEFAULT 'Sandnes'  
);
```

# Default constraint on alter

- *MySQL:*

ALTER TABLE Persons

ALTER City SET DEFAULT 'Sandnes';

- *SQL Server:*

ALTER TABLE Persons

ADD CONSTRAINT df\_City

DEFAULT 'Sandnes' FOR City;

- *MS Access:*

ALTER TABLE Persons

ALTER COLUMN City SET DEFAULT 'Sandnes';

- *Oracle:*

ALTER TABLE Persons

MODIFY City DEFAULT 'Sandnes';

# Default constraint drop

- *MySQL:*

ALTER TABLE Persons

ALTER City DROP DEFAULT;

- *SQL Server / Oracle / MS Access:*

ALTER TABLE Persons

ALTER COLUMN City DROP DEFAULT;

SQL Server:

ALTER TABLE Persons

ALTER COLUMN City DROP DEFAULT;

# Check constraint on create

- *MySQL:*

```
CREATE TABLE Persons (  
  ID int NOT NULL,  
  LastName varchar(255) NOT NULL,  
  FirstName varchar(255),  
  Age int,  
  CHECK (Age>=18)  
);
```

- *SQL Server / Oracle / MS Access:*

```
CREATE TABLE Persons (  
  ID int NOT NULL,  
  LastName varchar(255) NOT NULL,  
  FirstName varchar(255),  
  Age int CHECK (Age>=18)  
);
```



# Check constraint on alter

- *MySQL / SQL Server / Oracle / MS Access:*

```
ALTER TABLE Persons
```

```
ADD CHECK (Age>=18);
```

- *MySQL / SQL Server / Oracle / MS Access:*

```
ALTER TABLE Persons
```

```
ADD CONSTRAINT CHK_PersonAge CHECK (Age>=18 AND City='Sand  
nes');
```

# Check constraint drop

- *SQL Server / Oracle / MS Access:*

ALTER TABLE Persons

DROP CONSTRAINT CHK\_PersonAge;

- *MySQL:*

ALTER TABLE Persons

DROP CHECK CHK\_PersonAge;