

Chapter 4: NULL

NULL in SQL, as well as programming in general, means literally "nothing". In SQL, it is easier to understand as "the absence of any value".

It is important to distinguish it from seemingly empty values, such as the empty string '' or the number 0, neither of which are actually NULL.

It is also important to be careful not to enclose NULL in quotes, like 'NULL', which is allowed in columns that accept text, but is not NULL and can cause errors and incorrect data sets.

Section 4.1: Filtering for NULL in queries

The syntax for filtering for NULL (i.e. the absence of a value) in WHERE blocks is slightly different than filtering for specific values.

```
SELECT * FROM Employees WHERE ManagerId IS NULL ;
SELECT * FROM Employees WHERE ManagerId IS NOT NULL ;
```

Note that because NULL is not equal to anything, not even to itself, using equality operators = NULL or <> NULL (or != NULL) will always yield the truth value of UNKNOWN which will be rejected by WHERE.

WHERE filters all rows that the condition is FALSE or UNKNOWN and keeps only rows that the condition is TRUE.

Section 4.2: Nullable columns in tables

When creating tables it is possible to declare a column as nullable or non-nullable.

```
CREATE TABLE MyTable
(
    MyCol1 INT NOT NULL, -- non-nullable
    MyCol2 INT NULL     -- nullable
);
```

By default every column (except those in primary key constraint) is nullable unless we explicitly set NOT NULL constraint.

Attempting to assign NULL to a non-nullable column will result in an error.

```
INSERT INTO MyTable (MyCol1, MyCol2) VALUES (1, NULL) ; -- works fine

INSERT INTO MyTable (MyCol1, MyCol2) VALUES (NULL, 2) ;
-- cannot insert
-- the value NULL into column 'MyCol1', table 'MyTable';
-- column does not allow nulls. INSERT fails.
```

Section 4.3: Updating fields to NULL

Setting a field to NULL works exactly like with any other value:

```
UPDATE Employees
SET ManagerId = NULL
WHERE Id = 4
```

Section 4.4: Inserting rows with NULL fields

For example inserting an employee with no phone number and no manager into the Employees example table:

```
INSERT INTO Employees
  (Id, FName, LName, PhoneNumber, ManagerId, DepartmentId, Salary, HireDate)
VALUES
  (5, 'Jane', 'Doe', NULL, NULL, 2, 800, '2016-07-22') ;
```
