

## Search:

**1-Set Null :** **SET NULL** in a database is a rule used with **foreign keys**. It tells the database what to do **when a referenced (parent) record is deleted or updated**.

### What does SET NULL mean?

When you define a foreign key with **ON DELETE SET NULL** or **ON UPDATE SET NULL**, it means: If the referenced row changes or is deleted, the foreign key value in the child table will be set to **NULL** instead of deleting the child row or blocking the action.

### Important rules

#### 1. Foreign key column must allow NULL

- SET NULL does **not delete child rows**
- Used when child data can exist **without** the parent

### When should you use SET NULL?

Use **SET NULL** when:

- The child record is still meaningful without the parent
- You want to keep historical data
- You don't want automatic deletion (CASCADE)

### Comparison with other options

Rule	Behavior
CASCADE	Deletes or updates child rows
SET NULL	Sets foreign key to NULL
SET DEFAULT	Sets foreign key to a default value
NO ACTION / RESTRICT	Prevents delete/update

**2-Set Default:** is related to **default values** for columns and **what happens when data is inserted or when a referenced row is deleted/updated.**

### 1 DEFAULT value for a column:

A **DEFAULT** value is automatically used **when no value is provided** during an **INSERT**.

### 2 SET DEFAULT in FOREIGN KEY constraints

SET DEFAULT is used with **ON DELETE** or **ON UPDATE** in **foreign keys**.

#### Meaning

When the **parent row** is deleted or updated, the **child row's foreign key column is set to its DEFAULT value**, not deleted.

#### What happens?

- If a **Library** row is deleted
- All related **Books.Library\_ID** will be set to **0** (the DEFAULT)

#### ⚠ Important:

- The foreign key column **must have a DEFAULT value**
- That default value **must exist in the parent table** (e.g., Library\_ID = 0)

### 3 Comparison with other options

Option	Meaning
CASCADE	Deletes/updates child rows
SET NULL	Sets foreign key to NULL

SET DEFAULT	Sets foreign key to its DEFAULT value
NO ACTION	Prevents delete/update

## 4 When to use SET DEFAULT

✓ Use SET DEFAULT when:

- You want to keep child records
- But assign them to a **default or “unknown” parent**
- Example: Unassigned Library, General Department

## Simple summary 🔗

- **DEFAULT** → automatic value when inserting
- **SET DEFAULT** → assigns default value when parent row is deleted or updated
- Requires a valid default value

If you want, I can also show:

- SET DEFAULT vs SET NULL
- A real **Library Management System** example
- SQL Server–specific behavior

**3-No action :** In a database, **NO ACTION** is a rule used with **foreign key constraints** to control what happens when a related record in a **parent table** is **updated or deleted**

## What does NO ACTION mean?

**NO ACTION** means:

**Do nothing automatically, but do not allow the operation if it breaks referential integrity.**

So:

- If a **parent row** is being **deleted or updated**
- And there are **related rows in the child table**
- The database will **reject the operation** ✗

## Important note (SQL Server)

In **SQL Server**:

- **NO ACTION** and **RESTRICT** behave the **same**
- The check happens **at the end of the statement**

## When should you use NO ACTION?

Use **NO ACTION** when:

- You want **manual control**
- You don't want accidental deletes
- You want to **force the user to delete child records first**

**4-Cascade:** In databases, **CASCADE** is a rule used with **foreign keys** to automatically apply changes from a **parent table** to related records in a **child table**.

It helps maintain **referential integrity**.

## What does CASCADE mean?

**CASCADE** means that when an action happens in the parent table, the **same action is automatically applied** to the related rows in the child table.

## Types of CASCADE

### 1 ON DELETE CASCADE

When a row in the **parent table** is deleted, all related rows in the **child table** are **automatically deleted**.

### 2 ON UPDATE CASCADE

When the **primary key value** in the parent table is updated, the related **foreign key values** in the child table are **updated automatically**.

## Why use CASCADE?

- ✓ Prevents **orphan records**
- ✓ Keeps data **consistent**
- ✓ Reduces manual delete/update work

Option	Meaning
CASCADE	Apply the same action automatically
SET NULL	Set foreign key to NULL
SET DEFAULT	Set foreign key to default value
NO ACTION / RESTRICT	Prevent the action

CASCADE = parent change → child changes automatically