

What is ALTER TABLE?

ALTER TABLE is used to **change the structure of an existing table** without deleting the data inside it.

You can use it to:

- Add or remove columns
 - Modify column data types
 - Rename columns or tables
 - Add or drop indexes and constraints
 - Set default values
 - Change table storage options
-

Basic Syntax

```
ALTER TABLE table_name  
    action;
```

You can perform **multiple actions in one command**:

```
ALTER TABLE table_name  
    action1,  
    action2,  
    action3;
```

1. Add a Column

Example

```
ALTER TABLE users  
ADD COLUMN age INT;
```

Explanation

- Adds a new column named `age`
- `INT` is the data type
- Existing rows will have `NULL` in this column (unless a default is set)

Add column with default value

```
ALTER TABLE users  
ADD COLUMN country VARCHAR(50) DEFAULT 'USA';
```

2. Add a Column at a Specific Position

```
ALTER TABLE users
ADD COLUMN created_at DATETIME AFTER email;
```

Explanation

- `AFTER email` places the column after `email`
- Use `FIRST` to put it at the beginning

```
ADD COLUMN id INT FIRST;
```

- Column order is mostly cosmetic; it doesn't affect performance.

3. Modify a Column (Change Data Type or Attributes)

```
ALTER TABLE users
MODIFY COLUMN age SMALLINT;
```

Explanation

- Changes the data type of `age`
- Column name stays the same
- Data must be compatible with the new type

Modify with constraints

```
ALTER TABLE users
MODIFY COLUMN email VARCHAR(255) NOT NULL;
```

4. Rename a Column

(MySQL 8.0+)

```
ALTER TABLE users
RENAME COLUMN username TO user_name;
```

Older MySQL versions

```
ALTER TABLE users
CHANGE username user_name VARCHAR(100);
```

- With `CHANGE`, you must **redefine the full column definition**.
-

5. Drop (Delete) a Column

```
ALTER TABLE users
DROP COLUMN age;
```

Explanation

- Permanently removes the column and its data
 - This operation cannot be undone
-

6. Rename a Table

```
ALTER TABLE users
RENAME TO customers;
```

or

```
RENAME TABLE users TO customers;
```

7. Multiple Changes in One Command

```
ALTER TABLE users
ADD COLUMN phone VARCHAR(20),
MODIFY COLUMN email VARCHAR(255) NOT NULL,
DROP COLUMN age;
```

- More efficient than running multiple `ALTER TABLE` statements.