ALTER TABLE to Change Columns: Add/Drop

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WHAT'S COVERED

In this lesson, you will learn about using the ALTER TABLE statement to add and drop columns in a table, in two parts. Specifically, this lesson will cover:

1. Adding Columns
2. Dropping Columns

1. Adding Columns

It is uncommon to change a table's column structure after its initial creation; typically, a table's columns are carefully planned out in advance. However, changes in business rules may necessitate adding, modifying, or dropping a column.. But there are times when we may need to make changes by adding or dropping a column. This should be done very carefully and with a lot of attention to what the possible outcomes are going to be.

When a new column won't add, or when adding the new column causes a problem, it's probably due to a constraint.

> EXAMPLE One of the most common problems occurs when trying to add a NOT NULL column to a table with existing data. Doing so will render all the existing records invalid because they won't have any data in that column. Avoiding that problem is a multi-step process. You would need to add the column with the NULL property initially, enter filler data in the new column, and then set it to NOT NULL.

HINT

Be sure to make a complete backup before making structural changes to a database. If possible, create a test/dev system with a copy of your database and test your planned changes there, before incorporating those changes into a live system.

The **ALTER TABLE** statement has three options for modifying the table structure: ADD, MODIFY, and DROP. In this lesson, we will look at ADD (for adding columns) and DROP (for removing columns).

The basic syntax to add a column to a table looks like the following:

```
ALTER TABLE <tablename>
ADD <columnname> <datatype>;
```

Notice that the structure of the command after the ADD is quite similar to what we would see in a CREATE TABLE command.

Consider if we had the following table created:

```
CREATE TABLE contact(contact_id SERIAL PRIMARY KEY);
```

We could ALTER the table to add in the username like this:

```
ALTER TABLE contact
ADD username VARCHAR(50);
```

If we wanted to add multiple columns, we would separate each new column with a comma. Using the same example table above, we could add two more columns:

```
ALTER TABLE contact
ADD password VARCHAR(50),
ADD email VARCHAR(50);
```

TERM TO KNOW

ALTER TABLE

A statement that makes structural changes to a table.

2. Dropping Columns

Some database systems will not allow you to drop (remove) a column unless the column does not contain any values. Otherwise, dropping a column could delete important data that other tables may use. PostgreSQL, however, will allow you to drop a column even if there is data in the column, so you will want to be careful when dropping a column.

Make sure you have tested this operation on a backup copy of the database before performing it on a live system. Failing to do so can result in losing critical data. The DROP operation is instantaneous and irreversible.

To remove a column, we would use a DROP command:

```
ALTER TABLE <tablename>
```

```
DROP <columnname>;
```

HINT

For example, to remove the username column from the contact table, we would do the following:

```
ALTER TABLE contact
DROP username;
```

To remove two columns at once, do the following:

```
ALTER TABLE contact
DROP password,
DROP email;
```

You could also mix the ADD and DROP options together in a single statement, although it is best practice to keep them in separate commands.

WATCH

TRY IT

Your turn! Open the SQL tool by clicking on the LAUNCH DATABASE button below. Then, enter in one of the examples above and see how it works. Next, try your own choices for which columns you want the query to provide.

SUMMARY

In this lesson, you learned how to use the ALTER TABLE statement in PostgreSQL to modify the structure of an existing table by **adding or dropping (removing) columns**. It is critical to make backups and do a test operation on backup data before making structural changes to a live system. After taking the needed precautions to avoid critical data loss, you can use the ADD operator to add columns to the table, and the DROP operator to remove columns.

Source: THIS TUTORIAL WAS AUTHORED BY DR. VINCENT TRAN, PHD (2020) AND Faithe Wempen (2024) FOR SOPHIA LEARNING. PLEASE SEE OUR TERMS OF USE.

TERMS TO KNOW

ALTER TABLE

A statement that makes structural changes to a table.