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SQL Server STRING_AGG Function

Summary: in this tutorial, you will learn how to use the SQL Server `STRING_AGG()` function to concatenate rows of strings into one string with a specified separator.

SQL Server `STRING_AGG()` function overview

The `STRING_AGG()` is an [aggregate function](#) that concatenates rows of strings into a single string, separated by a specified separator. It does not add the separator at the end of the result string.

The following shows the syntax of the `STRING_AGG()` function:

```
1  STRING_AGG ( input_string, separator ) [ order_clause ]
```

In this syntax:

- `input_string` is any type that can be converted `VARCHAR` and `NVARCHAR` when concatenation.
- `separator` is the separator for the result string. It can be a literal or variable.
- `order_clause` specifies the sort order of concatenated results using `WITHIN GROUP` clause:

```
1  WITHIN GROUP ( ORDER BY expression [ ASC | DESC ] )
```

SQL Server `STRING_AGG()` function

We will use the `sales.customers` table from the sample database for the demonstration:

sales.customers

* customer_id
first_name
last_name
phone
email
street
city
state
zip_code

Using `STRING_AGG()` function to generate comma-separated values

This example uses the `STRING_AGG()` function to generate lists of emails of customers by the city:

```
1  SELECT
2      city,
3      STRING_AGG(email,';') email_list
4  FROM
5      sales.customers
6  GROUP BY
7      city;
```

Here is the partial result set:

Amsterdam	toshia.cardenas@gmail.com;zulema.browning@gmail.com;garland....
Anaheim	joaquin.hawkins@aol.com;tony.hicks@gmail.com;ollie.zimmerman@...
Apple Valley	joy.underwood@gmail.com;shona.mcmillan@msn.com;ji.burt@hotm...
Astoria	leola.gould@gmail.com;shu.mays@gmail.com;zelma.browning@aol....
Atwater	mikel.wilkerson@msn.com;aide.franco@msn.com;corene.wall@msn...
Auburn	wm.pope@msn.com;melita.dominguez@msn.com;tarra.guerrero@a...
Bakersfield	desire.mcgowan@msn.com;tayna.wade@hotmail.com;morton.barro...
Baldwin	lashawna.richardson@hotmail.com;justina.jenkins@yahoo.com;gine...
Baldwinsville	kellye.campbell@gmail.com;josephine.dale@aol.com;tonda.webb@...

To sort the email list, you use the `WITHIN GROUP` clause:

```
SELECT
    city,
    STRING_AGG(email,';')
        WITHIN GROUP (ORDER BY email) email_list
FROM
    sales.customers
GROUP BY
    city;
```

The following picture shows the partial output:

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Amsterdam	garland.weaver@gmail.com;nathanael.bradley@aol.com;terra.pickett@aol.com;...
Anaheim	ana.palmer@yahoo.com;delma.bailey@gmail.com;joaquin.hawkins@aol.com;jo...
Apple Valley	angelina.lloyd@yahoo.com;hayden.cross@gmail.com;hedwig.paul@msn.com;h...
Astoria	cassidy.clark@hotmail.com;dorothea.chang@gmail.com;julia.joyner@msn.com;l...
Atwater	aide.franco@msn.com;corene.wall@msn.com;joesph.delacruz@aol.com;mauric...
Auburn	barry.albert@gmail.com;melita.dominguez@msn.com;tarra.guerrero@aol.com;w...
Bakersfield	desire.mcgowan@msn.com;katina.mcintosh@yahoo.com;latosha.dalton@yaho...
Baldwin	ashanti.parks@hotmail.com;cyndi.dyer@msn.com;ginette.edwards@hotmail.co...

In this tutorial, you have learned how to use the SQL Server `STRING_AGG()` function to concatenate rows of strings into one string with a specified separator.

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OR

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