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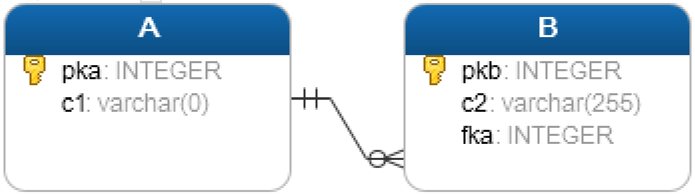
PostgreSQL INNER JOIN

Summary: in this tutorial, you will learn how to select data from multiple tables by using the **PostgreSQL INNER JOIN** clause.

Introduction to PostgreSQL INNER JOIN clause

So far, you have learned how to select data from a table, choosing which columns and rows you want, and how to sort the result set in a particular order.

It is time to move to one of the most important concepts in the database called joining that allows you to relate data in one table to the data in other tables. There are several kinds of joins that include`INNER JOIN, OUTER JOIN` and self-join. This tutorial focuses on the `INNER JOIN`. Suppose you want to get data from two tables named `A` and `B`. The `B` table has the `fka`field that relates to the primary key of the `A`table.



To get data from both tables, you use the `INNER JOIN` clause in the `SELECT` statement as follows:

```
SELECT
   A.pka,
   A.c1,
   B.pkb,
   B.c2
FROM
   A
INNER JOIN B ON A .pka = B.fka;
```

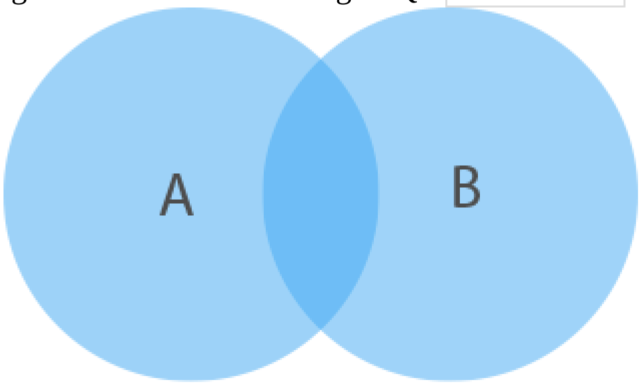
To join A table to B table:

- First, you specify the column in both tables from which you want to select data in the `SELECT` clause
- Second, you specify the main table i.e., `A` in the `FROM` clause.
- Third, you specify the table that the main table joins to i.e., B in the `INNER JOIN`clause. In addition, you put a join condition after the `ON` keyword i.e, `A.pka = B.fka`.

For each row in the `A` table, PostgreSQL scans the `B` table to check if there is any row that matches the condition i.e., `A.pka = B.fka`. If it finds a match, it combines columns of both rows into one row and add the combined row to the returned result set.

The primary key column (`pka)` and foreign key column (`fka`) are typically indexed; therefore, PostgreSQL only has to check for the match in the indexes, which is very fast.

Sometimes, `A` and `B` tables have the same column name so we have to refer to the column as `table_name.column_name` to avoid ambiguity. In case the name of the table is long, you can use a table alias e.g., `tbl`and refer to the column as `tbl.column_name`.
The following Venn Diagram illustrates how PostgreSQL `INNER JOIN` clause works.



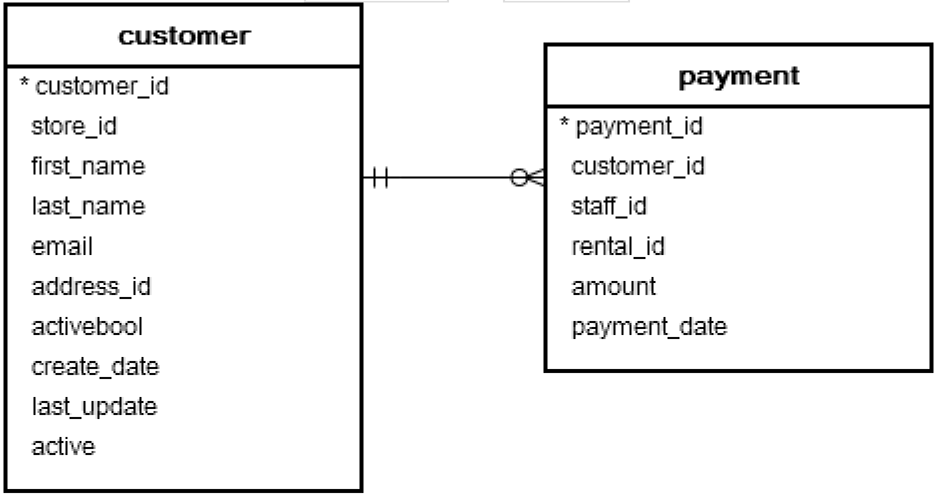
PostgreSQL INNER JOIN

The `INNER JOIN` clause returns rows in A table that have the corresponding rows in the B table.

PostgreSQL INNER JOIN examples

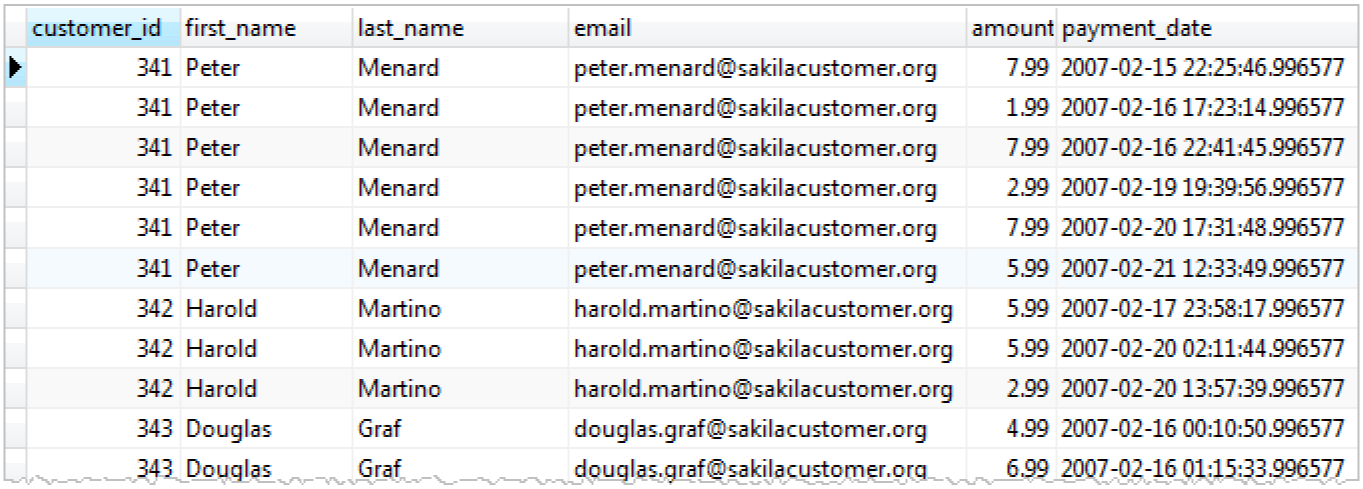
PostgreSQL INNER JOIN to join 2 tables example

Let's take a look at the `customer`and `payment`tables in the sample database.



Each customer may have zero or many payments. Each payment belongs to one and only one customer. The `customer_id` field establishes the link between two tables.
You can use the `INNER JOIN` clause to join the customer table to payment table as follows:

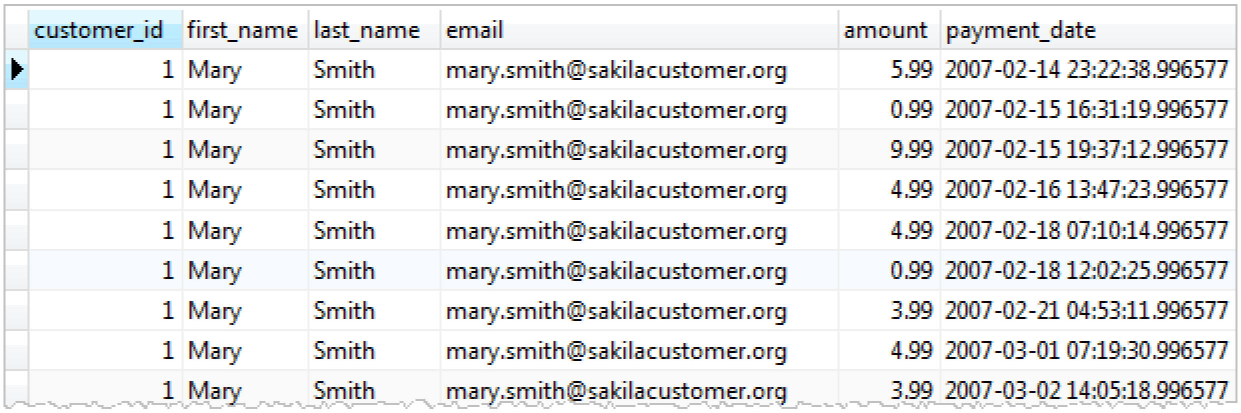
```
SELECT
   customer.customer_id,
   first_name,
   last_name,
   email,
   amount,
    payment_date
FROM
    customer
INNER JOIN payment ON payment.customer_id = customer.customer_id;
```



customer_id	first_name	last_name	email	amount	payment_date
341	Peter	Menard	peter.menard@sakilacustomer.org	7.99	2007-02-15 22:25:46.996577
341	Peter	Menard	peter.menard@sakilacustomer.org	1.99	2007-02-16 17:23:14.996577
341	Peter	Menard	peter.menard@sakilacustomer.org	7.99	2007-02-16 22:41:45.996577
341	Peter	Menard	peter.menard@sakilacustomer.org	2.99	2007-02-19 19:39:56.996577
341	Peter	Menard	peter.menard@sakilacustomer.org	7.99	2007-02-20 17:31:48.996577
341	Peter	Menard	peter.menard@sakilacustomer.org	5.99	2007-02-21 12:33:49.996577
342	Harold	Martino	harold.martino@sakilacustomer.org	5.99	2007-02-17 23:58:17.996577
342	Harold	Martino	harold.martino@sakilacustomer.org	5.99	2007-02-20 02:11:44.996577
342	Harold	Martino	harold.martino@sakilacustomer.org	2.99	2007-02-20 13:57:39.996577
343	Douglas	Graf	douglas.graf@sakilacustomer.org	4.99	2007-02-16 00:10:50.996577
343	Douglas	Graf	douglas.graf@sakilacustomer.org	6.99	2007-02-16 01:15:33.996577

You can add the `ORDER BY` clause to sort the result set by customer id as follows:

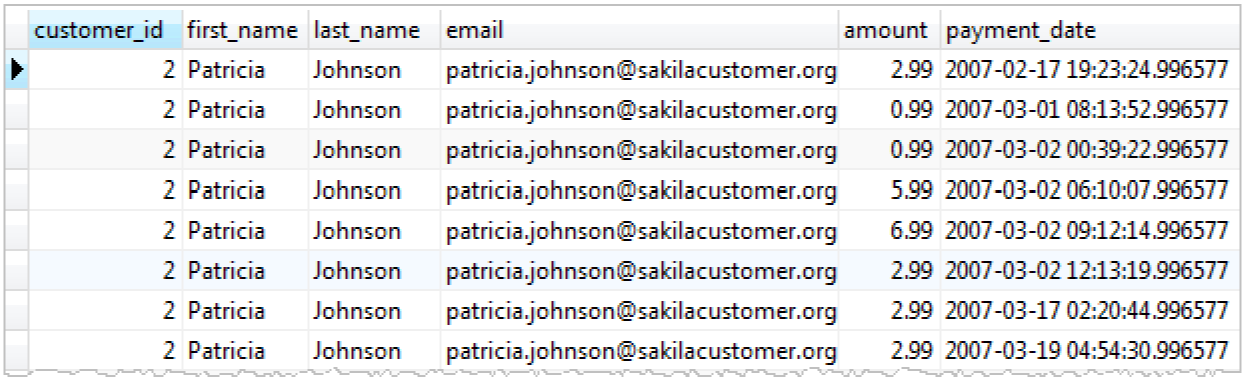
```
SELECT
    customer.customer_id,
    first_name,
    last_name,
    email,
    amount,
    payment_date
FROM
    customer
INNER JOIN payment ON payment.customer_id = customer.customer_id
ORDER BY
    customer.customer_id;
```



customer_id	first_name	last_name	email	amount	payment_date
1	Mary	Smith	mary.smith@sakilacustomer.org	5.99	2007-02-14 23:22:38.996577
1	Mary	Smith	mary.smith@sakilacustomer.org	0.99	2007-02-15 16:31:19.996577
1	Mary	Smith	mary.smith@sakilacustomer.org	9.99	2007-02-15 19:37:12.996577
1	Mary	Smith	mary.smith@sakilacustomer.org	4.99	2007-02-16 13:47:23.996577
1	Mary	Smith	mary.smith@sakilacustomer.org	4.99	2007-02-18 07:10:14.996577
1	Mary	Smith	mary.smith@sakilacustomer.org	0.99	2007-02-18 12:02:25.996577
1	Mary	Smith	mary.smith@sakilacustomer.org	3.99	2007-02-21 04:53:11.996577
1	Mary	Smith	mary.smith@sakilacustomer.org	4.99	2007-03-01 07:19:30.996577
1	Mary	Smith	mary.smith@sakilacustomer.org	3.99	2007-03-02 14:05:18.996577

You can also use a `WHERE` clause to filter customer. The following query returns customer’s rental data for the customer id 2:

```
SELECT
    customer.customer_id,
    first_name,
    last_name,
    email,
    amount,
    payment_date
FROM
    customer
INNER JOIN payment ON payment.customer_id = customer.customer_id
WHERE
    customer.customer_id = 2;
```

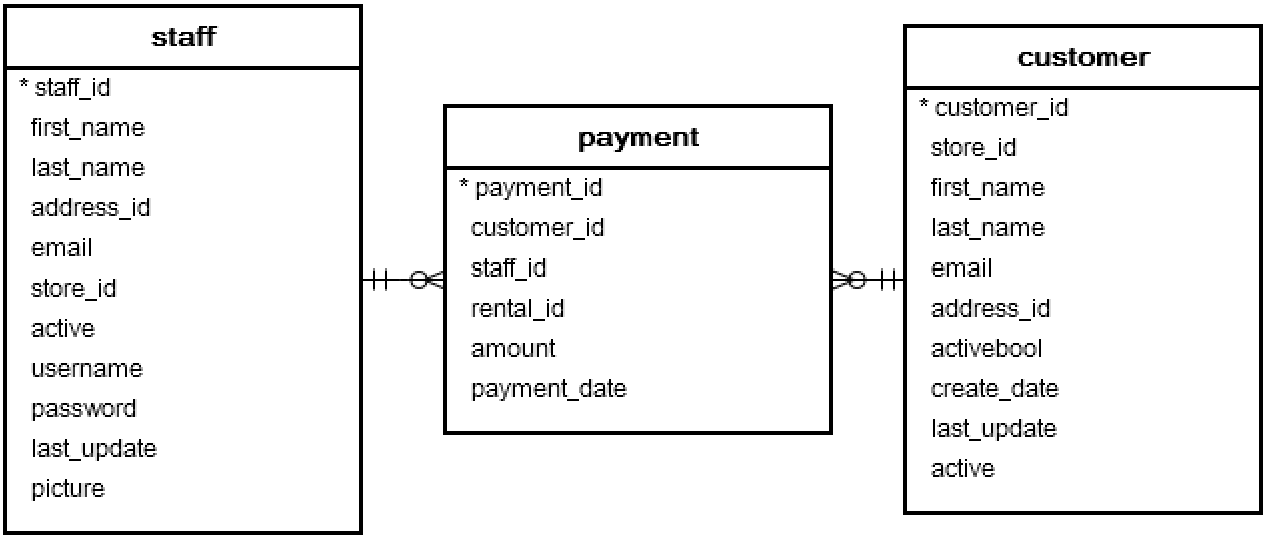


customer_id	first_name	last_name	email	amount	payment_date
2	Patricia	Johnson	patricia.johnson@sakilacustomer.org	2.99	2007-02-17 19:23:24.996577
2	Patricia	Johnson	patricia.johnson@sakilacustomer.org	0.99	2007-03-01 08:13:52.996577
2	Patricia	Johnson	patricia.johnson@sakilacustomer.org	0.99	2007-03-02 00:39:22.996577
2	Patricia	Johnson	patricia.johnson@sakilacustomer.org	5.99	2007-03-02 06:10:07.996577
2	Patricia	Johnson	patricia.johnson@sakilacustomer.org	6.99	2007-03-02 09:12:14.996577
2	Patricia	Johnson	patricia.johnson@sakilacustomer.org	2.99	2007-03-02 12:13:19.996577
2	Patricia	Johnson	patricia.johnson@sakilacustomer.org	2.99	2007-03-17 02:20:44.996577
2	Patricia	Johnson	patricia.johnson@sakilacustomer.org	2.99	2007-03-19 04:54:30.996577

PostgreSQL INNER JOIN to join 3 tables example

The following diagram illustrates the relationship between three tables: staff, payment, and customer.

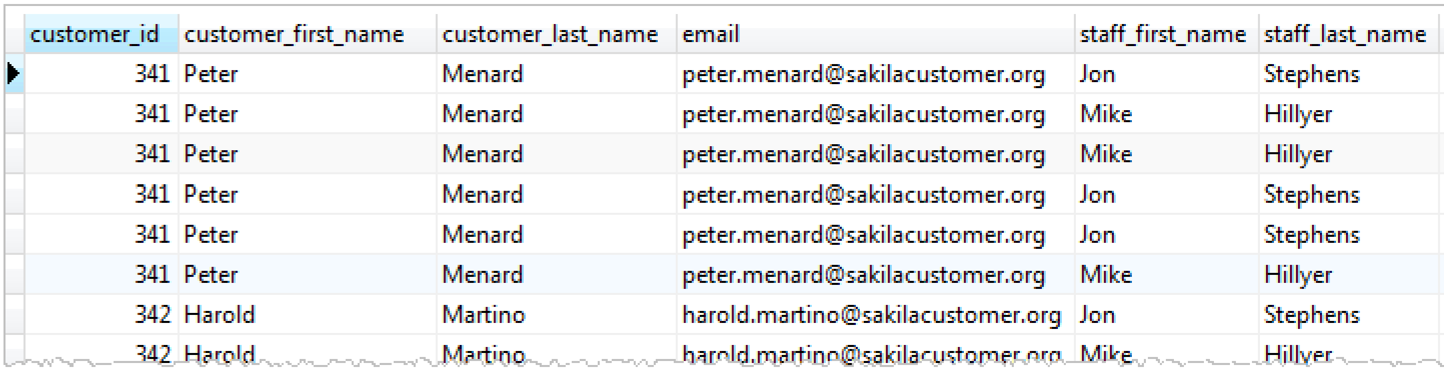
- Each staff relates to zero or many payments. Each payment is processed by one and only one staff.
- Each customer has zero or many payments. Each payment belongs to one and only customer.



To join the three tables, you place the second `INNER JOIN` clause after the first `INNER JOIN` clause as the following query:

```
SELECT
```

```
    customer.customer_id,
    customer.first_name customer_first_name,
    customer.last_name customer_last_name,
    customer.email,
    staff.first_name staff_first_name,
    staff.last_name staff_last_name,
    amount,
    payment_date
FROM
    customer
INNER JOIN payment ON payment.customer_id = customer.customer_id
INNER JOIN staff ON payment.staff_id = staff.staff_id;
```



customer_id	customer_first_name	customer_last_name	email	staff_first_name	staff_last_name
341	Peter	Menard	peter.menard@sakilacustomer.org	Jon	Stephens
341	Peter	Menard	peter.menard@sakilacustomer.org	Mike	Hillyer
341	Peter	Menard	peter.menard@sakilacustomer.org	Mike	Hillyer
341	Peter	Menard	peter.menard@sakilacustomer.org	Jon	Stephens
341	Peter	Menard	peter.menard@sakilacustomer.org	Jon	Stephens
341	Peter	Menard	peter.menard@sakilacustomer.org	Mike	Hillyer
342	Harold	Martino	harold.martino@sakilacustomer.org	Jon	Stephens
342	Harold	Martino	harold.martino@sakilacustomer.org	Mike	Hillyer

To join more than three tables, you apply the same technique.

In this tutorial, we have shown you how to select data from multiple tables by joining one table to other tables using PostgreSQL `INNER JOIN` clause.

Related Tutorials

- PostgreSQL Cross Join By Example
- PostgreSQL NATURAL JOIN Explained By Examples
- PostgreSQL FULL OUTER JOIN