Overview of basic arithmetic operators

FUNCTIONS FOR MANIPULATING DATA IN POSTGRESQL

SQL

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Topics

- Overview of basic arithmetic operators
- The `CURRENT_DATE` , `CURRENT_TIMESTAMP` , `NOW()` functions
- The `AGE()` function
- The `EXTRACT()` , `DATE_PART()` , and `DATE_TRUNC()` functions

Adding and subtracting date / time data

```
SELECT date '2005-09-11' - date '2005-09-10';
```

```
+---------+
| integer |
|---------|
| 1       |
+---------+
```

Adding and subtracting date / time data

```sql
SELECT date '2005-09-11' + integer '3';
```

```
+------------+
| date       |
|------------|
| 2005-09-14 |
+------------+
```

Adding and subtracting date / time data

```
SELECT date '2005-09-11 00:00:00' - date '2005-09-09 12:00:00';
```

```
+-----------------+
| interval        |
|-----------------|
| 1 day 12:00:00  |
+-----------------+
```

Calculating time periods with AGE

```
SELECT AGE(timestamp '2005-09-11 00:00:00', timestamp '2005-09-09 12:00:00');
```

```
+----------------+
| interval       |
|----------------|
| 1 day 12:00:00 |
+----------------+
```

DVDs, really??

```sql
SELECT
    AGE(rental_date)
FROM rental;
```

```
+-----------------------------------+
| age                               |
|-----------------------------------|
| 13 years 11 mons 12 days 01:06:30 |
| 13 years 11 mons 12 days 01:05:27 |
| 13 years 11 mons 12 days 00:56:21 |
+-----------------------------------+
```

Date / time arithmetic using INTERVALs

```
SELECT rental_date + INTERVAL '3 days' as expected_return
FROM rental;
```

```
+---------------------+
| expected_return     |
|---------------------|
| 2005-05-27 22:53:30 |
+---------------------+
```

Date / time arithmetic using INTERVALs

```
SELECT timestamp '2019-05-01' + 21 * INTERVAL '1 day';
```

```
+----------------------------+
| timestamp without timezone |
|----------------------------|
| 2019-05-22 00:00:00        |
+----------------------------+
```

Let's practice!

FUNCTIONS FOR MANIPULATING DATA IN POSTGRESQL

Functions for retrieving current date/time

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Retrieving the current timestamp

```sql
SELECT NOW();
```

```
+-------------------------------+
| now()                         |
|-------------------------------|
| 2019-04-19 02:51:18.448641+00 |
+-------------------------------+
```

Retrieving the current timestamp

```sql
SELECT NOW()::timestamp;
```

```
+----------------------------+
| now()                      |
|----------------------------|
| 2019-04-19 02:51:18.448641 |
+----------------------------+
```

Retrieving the current timestamp

PostgreSQL specific casting

```sql
SELECT NOW()::timestamp;
```

CAST() function

```sql
SELECT CAST(NOW() as timestamp);
```

Retrieving the current timestamp

```sql
SELECT CURRENT_TIMESTAMP;
```

```
+-------------------------------+
| current_timestamp             |
|-------------------------------|
| 2019-04-19 02:51:18.448641+00 |
+-------------------------------+
```

Retrieving the current timestamp

```
SELECT CURRENT_TIMESTAMP(2);
```

```
+-------------------------------+
| current_timestamp             |
|-------------------------------|
| 2019-04-19 02:51:18.44+00     |
+-------------------------------+
```

Current date and time

```sql
SELECT CURRENT_DATE;
```

```
+--------------+
| current_date |
|--------------|
| 2019-04-19   |
+--------------+
```

Current date and time

```
SELECT CURRENT_TIME;
```

```
+------------------------+
| current_time           |
|------------------------|
| 04:06:30.929845+00:00  |
+------------------------+
```

Let's practice!

FUNCTIONS FOR MANIPULATING DATA IN POSTGRESQL

Extracting and transforming date / time data

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datacamp

Extracting and transforming date and time data

Exploring the `EXTRACT()` , `DATE_PART()` and `DATE_TRUNC()` functions

- Transactional timestamp precision not useful for analysis

```
2005-05-13 08:53:53
```

- Often need to extract parts of timestamps

```
2005 or 5 or 2 or Friday
```

- Or convert / truncate timestamp precision to standardize

```
2005-05-13 00:00:00
```

Extracting and transforming date / time data

- EXTRACT(**field** *FROM* **source**)

```
SELECT EXTRACT(quarter FROM timestamp '2005-01-24 05:12:00') AS quarter;
```

- DATE_PART(**'field', source**)

```
SELECT DATE_PART('quarter', timestamp '2005-01-24 05:12:00') AS quarter;
```

```
+---------+
| quarter |
|---------|
| 1       |
+---------+
```

Extracting sub-fields from timestamp data

Transactional data from DVD Rentals *payment* table

```sql
SELECT * FROM payment;
```

```
+-----------------------------------------------------------------------------------+
| payment_id | customer_id | staff_id | rental_id | amount | payment_date        |
|------------|-------------|----------|-----------|--------|---------------------|
| 1          | 1           | 1        | 76        | 2.99   | 2005-05-25 11:30:37 |
| 2          | 1           | 1        | 573       | 0.99   | 2005-05-28 10:35:23 |
| 3          | 1           | 1        | 1185      | 5.99   | 2005-06-15 0:54:12  |
+-----------------------------------------------------------------------------------+
```

Extracting sub-fields from timestamp data

Data from *payment* table by year and quarter

```
SELECT
  EXTRACT(quarter FROM payment_date) AS quarter,
  EXTRACT(year FROM payment_date) AS year,
  SUM(amount) AS total_payments
FROM
  payment
GROUP BY 1, 2;
```

Results

```
+-----------------------------------+
| quarter | year | total_payments |
|---------|------|----------------|
| 2       | 2005 | 14456.31       |
| 3       | 2005 | 52446.02       |
| 1       | 2006 | 514.18         |
+-----------------------------------+
```

Truncating timestamps using DATE_TRUNC()

The `DATE_TRUNC()` function will truncate timestamp or interval data types.

- Truncate timestamp '2005-05-21 15:30:30' by year

```
SELECT DATE_TRUNC('year', TIMESTAMP '2005-05-21 15:30:30');
```

```
Result: 2005-01-01 00:00:00
```

- Truncate timestamp '2005-05-21 15:30:30' by month

```
SELECT DATE_TRUNC('month', TIMESTAMP '2005-05-21 15:30:30');
```

```
Result: 2005-05-01 00:00:00
```

Let's practice!

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