Conception Avancée de Bases de Données

ANALYZE

ANALYZE

- ANALYZE collects statistics about the contents of tables in the database, and stores the results in the pg_statistic system catalog.

- The query planner uses these statistics to help determine the most efficient execution plans for queries.

ANALYZE Behavior

- Statistics data are not updeated on the fly.
- ANALYSE (as well VACUUM) command forces statistics update.
- With no parameter, ANALYZE examines every table in the current database.
- With a parameter, ANALYZE examines only that table.

R creation

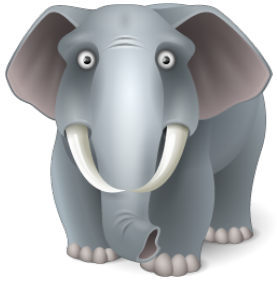
emmanuelfuchs — psql — 63×5

```
cavbd=> CREATE TABLE r (ri integer);
CREATE TABLE
cavbd=>
```

emmanuelfuchs — psql — 87×5

```
cavbd=> CREATE TABLE r (ri integer);
CREATE TABLE
cavbd=> INSERT INTO r (ri) SELECT round(random()*10) FROM generate_series(1, 1000000);
INSERT 0 1000000
cavbd=>
```

pg_class not updated

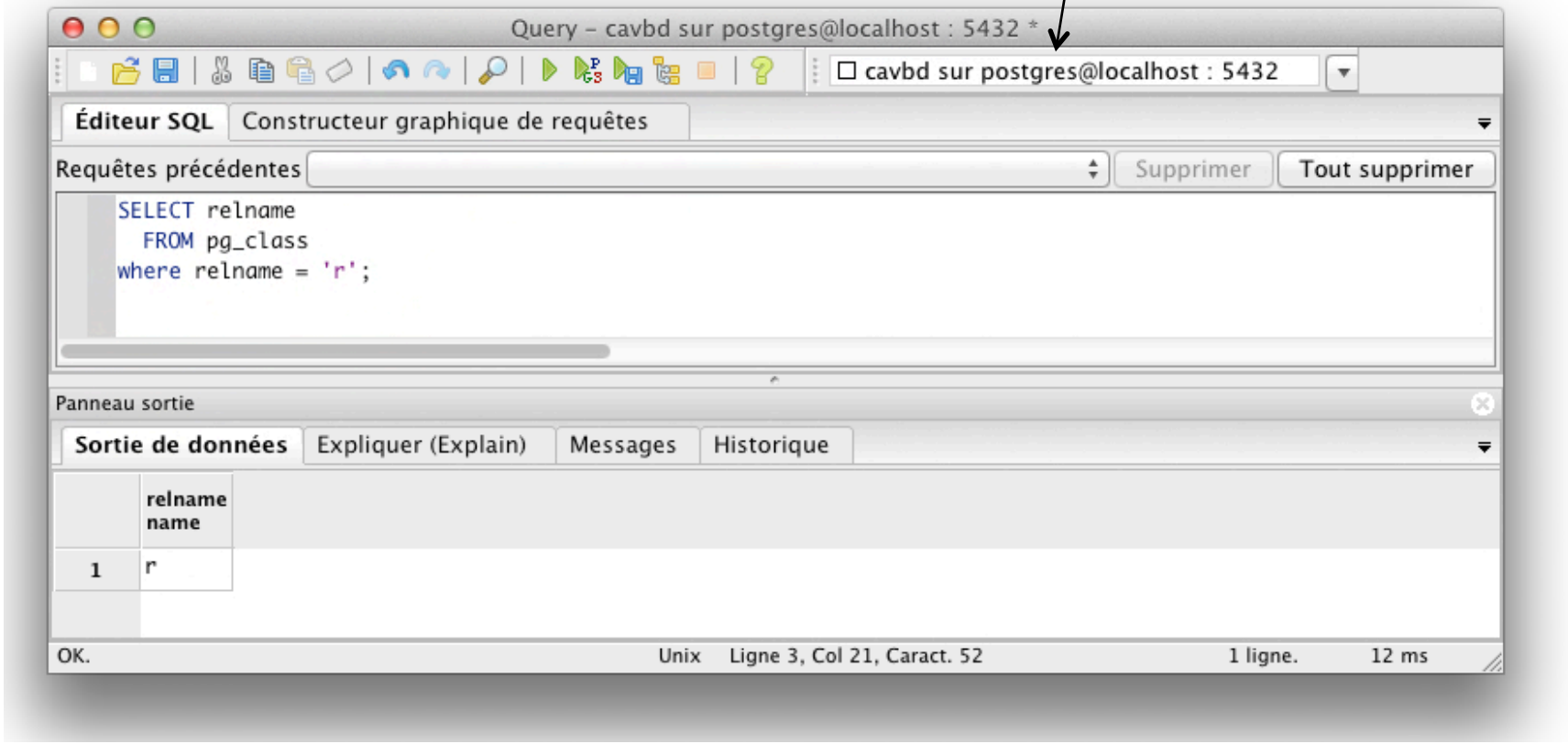


emmanuelfuchs — psql — 97×12

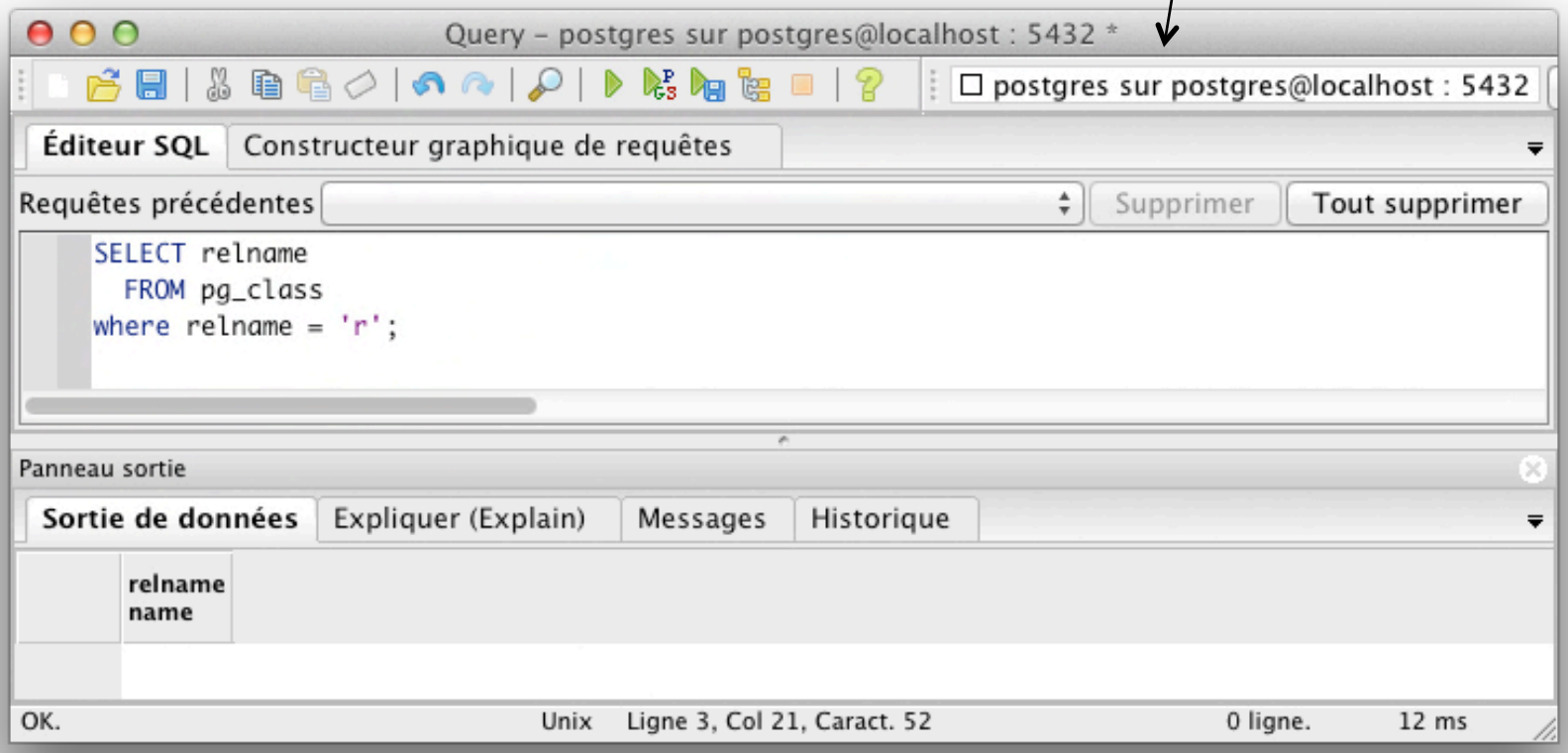
```
cavbd=> CREATE TABLE r (ri integer);
CREATE TABLE
cavbd=> INSERT INTO r (ri) SELECT round(random()*10) FROM generate_series(1, 1000000);
INSERT 0 1000000
cavbd=> SELECT relname, reltuples, relpages FROM pg_catalog.pg_class WHERE relname='r';
 relname | reltuples | relpages
---------+-----------+----------
 r       |         0 |        0
(1 row)

cavbd=>
```

pg_class location



Attention au catalog



pg_stats view not updated

emmanuelfuchs — psql — 71×25

```
cavbd=> CREATE TABLE r (ri integer);
CREATE TABLE
cavbd=> INSERT INTO r (ri) SELECT round(random()*10) FROM generate_seri
es(1, 1000000);
INSERT 0 1000000
cavbd=> SELECT relname, reltuples, relpages FROM pg_catalog.pg_class WH
ERE relname='r';
 relname | reltuples | relpages
---------+-----------+----------
 r       |         0 |        0
(1 row)

cavbd=> select *  from cavbd.pg_catalog.pg_stats where tablename='r';
 schemaname | tablename | attname | inherited | null_frac | avg_width |
 n_distinct | most_common_vals | most_common_freqs | histogram_bounds |
 correlation | most_common_elems | most_common_elem_freqs | elem_count_
histogram
------------+-----------+---------+-----------+-----------+-----------+
------------+------------------+-------------------+------------------+
------------+------------------+-----------------------+-----------
----------
(0 rows)

cavbd=>
```

pg_stats view not updated

emmanuelfuchs — psql — 71×25

```
cavbd=> CREATE TABLE r (ri integer);
CREATE TABLE
cavbd=> INSERT INTO r (ri) SELECT round(random()*10) FROM generate_seri
es(1, 1000000);
INSERT 0 1000000
cavbd=> SELECT relname, reltuples, relpages FROM pg_catalog.pg_class WH
ERE relname='r';
 relname | reltuples | relpages
---------+-----------+----------
 r       |         0 |        0
(1 row)

cavbd=> sele
 schemaname | tablename | attname | inherited | null_frac | avg_width |
 n_distinct | most_common_vals | most_common_freqs | histogram_bounds |
 correlation | most_common_elems | most_common_elem_freqs | elem_count_
histogram
------------+-----------+---------+-----------+-----------+-----------+
------------+------------------+-------------------+------------------+
------------+------------------+-----------------------+-----------
----------
(0 rows)

cavbd=>
```

reltuples and relpages are not updated

After ANALYZE pg_class is updated

emmanuelfuchs — psql — 93×27

```
cavbd=> CREATE TABLE r (ri integer);
CREATE TABLE
cavbd=> INSERT INTO r (ri) SELECT round(random()*10) FROM generate_series(1, 1000000);
INSERT 0 1000000
cavbd=> SELECT relname, reltuples, relpages FROM pg_catalog.pg_class WHERE relname='r';
 relname | reltuples | relpages
---------+-----------+----------
 r       |         0 |        0
(1 row)

cavbd=> select *  from cavbd.pg_catalog.pg_stats where tablename='r';
 schemaname | tablename | attname | inherited | null_frac | avg_width | n_distinct | most_com
mon_vals | most_common_freqs | histogram_bounds | correlation | most_common_elems | most_comm
on_elem_freqs | elem_count_histogram
------------+-----------+---------+-----------+-----------+-----------+------------+---------
---------+-------------------+------------------+-------------+-------------------+----------
--------------+----------------------
(0 rows)

cavbd=> ANALYZE r;                                                                  ANALYZE
cavbd=> SELECT relname, reltuples, relpages FROM pg_catalog.pg_class WHERE relname='r';
 relname | reltuples | relpages
---------+-----------+----------
 r       |     1e+06 |     4425
(1 row)

cavbd=>
```

After ANALYZE pg_stats view is updated

emmanuelfuchs — psql — 91×31

```
cavbd=> CREATE TABLE r (ri integer);
CREATE TABLE
cavbd=> INSERT INTO r (ri) SELECT round(random()*10) FROM generate_series(1, 1000000);
INSERT 0 1000000
cavbd=> select attname from cavbd.pg_catalog.pg_stats where tablename='r';
 attname
---------
(0 rows)

cavbd=> SELECT relname, reltuples, relpages FROM pg_catalog.pg_class WHERE relname='r';
 relname | reltuples | relpages
---------+-----------+----------
 r       |         0 |        0
(1 row)

cavbd=> ANALYZE r;
ANALYZE
cavbd=> SELECT relname, reltuples, relpages FROM pg_catalog.pg_class WHERE relname='r';
 relname | reltuples | relpages
---------+-----------+----------
 r       |     1e+06 |     4425
(1 row)

cavbd=> select attname from cavbd.pg_catalog.pg_stats where tablename='r';
 attname
---------
 ri
(1 row)

cavbd=>
```

After ANALYZE pg_stats view is updated

emmanuelfuchs — psql — 98×34

```
cavbd=> CREATE TABLE r (ri integer);
CREATE TABLE
cavbd=> INSERT INTO r (ri) SELECT round(random()*10) FROM generate_series(1, 1000000);
INSERT 0 1000000
cavbd=> SELECT relname, reltuples, relpages FROM pg_catalog.pg_class WHERE relname='r';
 relname | reltuples | relpages
---------+-----------+----------
 r       |         0 |        0
(1 row)

cavbd=> select *  from cavbd.pg_catalog.pg_stats where tablename='r';
 schemaname | tablename | attname | inherited | null_frac | avg_width | n_distinct | most_common_v
als | most_common_freqs | histogram_bounds | correlation | most_common_elems | most_common_elem_fr
eqs | elem_count_histogram
------------+-----------+---------+-----------+-----------+-----------+------------+--------------
----+-------------------+------------------+-------------+-------------------+--------------------
----+-----------------------
(0 rows)

cavbd=> ANALYZE r;                                                                    ANALYZE
cavbd=> SELECT relname, reltuples, relpages FROM pg_catalog.pg_class WHERE relname='r';
 relname | reltuples | relpages
---------+-----------+----------
 r       |     1e+06 |     4425
(1 row)

cavbd=> select attname, n_distinct   from cavbd.pg_catalog.pg_stats where tablename='r';
 attname | n_distinct
---------+------------
 ri      |         11
(1 row)

cavbd=>
```