Легкие запросы

1) Вывести средний возраст ученых, которые родились в период с 1902 по 1956

SELECT AVG(age(date\_of\_death,date\_of\_birth)) FROM Scientists WHERE (Scientists.date\_of\_birth > '1902-01-01' AND Scientists.date\_of\_birth < '1956-01-01');

До оптимизации:

QUERY PLAN

----------------------------------------------------------------------------------------------------------

Aggregate (cost=1.24..1.25 rows=1 width=16) (actual time=5.994..5.994 rows=1 loops=1)

-> Seq Scan on scientists (cost=0.00..1.23 rows=1 width=8) (actual time=0.206..0.229 rows=4 loops=1)

Filter: ((date\_of\_birth > '1902-01-01'::date) AND (date\_of\_birth < '1956-01-01'::date))

Rows Removed by Filter: 11

Planning time: 87.315 ms

Execution time: 10.514 ms

(6 строк)

Создание индекса: Создаем индекс по дате рождения учёного

CREATE INDEX ON Scientists (date\_of\_birth);

EXPLAIN (ANALYZE) SELECT AVG(age(date\_of\_death,date\_of\_birth)) FROM Scientists WHERE (Scientists.date\_of\_birth > '1902-01-01' AND Scientists.date\_of\_birth < '1956-01-01');

После оптимизации:

QUERY PLAN

----------------------------------------------------------------------------------------------------------

Aggregate (cost=1.24..1.25 rows=1 width=16) (actual time=0.135..0.135 rows=1 loops=1)

-> Seq Scan on scientists (cost=0.00..1.23 rows=1 width=8) (actual time=0.062..0.072 rows=4 loops=1)

Filter: ((date\_of\_birth > '1902-01-01'::date) AND (date\_of\_birth < '1956-01-01'::date))

Rows Removed by Filter: 11

Planning time: 1.444 ms

Execution time: 0.259 ms

(6 строк)

2) Вывести все достижения, открытые в 20 веке, которые нигде не публиковались/не афишировались, и год открытия достижения

SELECT discovery, year FROM Discoveries WHERE (year > 1900 AND year <2001) AND Discoveries.place ='No' ORDER BY year;

До оптимизации:

QUERY PLAN

-------------------------------------------------------------------------------------------------------------

Sort (cost=1.41..1.42 rows=1 width=182) (actual time=0.089..0.090 rows=3 loops=1)

Sort Key: year

Sort Method: quicksort Memory: 25kB

-> Seq Scan on discoveries (cost=0.00..1.40 rows=1 width=182) (actual time=0.067..0.072 rows=3 loops=1)

Filter: ((year > 1900) AND (year < 2001) AND ((place)::text = 'No'::text))

Rows Removed by Filter: 20

Planning time: 92.424 ms

Execution time: 0.145 ms

(8 строк)

Создание индекса: создаем индекс по году публикации/презентации достижения

CREATE INDEX ON Discoveries (year);

EXPLAIN (ANALYZE) SELECT discovery, year FROM Discoveries WHERE (year > 1900 AND year <2001) AND Discoveries.place ='No' ORDER BY year;

После оптимизации:

QUERY PLAN

-------------------------------------------------------------------------------------------------------------

Sort (cost=1.41..1.42 rows=1 width=182) (actual time=0.068..0.070 rows=3 loops=1)

Sort Key: year

Sort Method: quicksort Memory: 25kB

-> Seq Scan on discoveries (cost=0.00..1.40 rows=1 width=182) (actual time=0.037..0.042 rows=3 loops=1)

Filter: ((year > 1900) AND (year < 2001) AND ((place)::text = 'No'::text))

Rows Removed by Filter: 20

Planning time: 0.651 ms

Execution time: 0.105 ms

(8 строк)

3) Вывести все награды, которые в названии содержат слово Medal и которые были впервые присуждены, начиная с 1892 года

SELECT the\_name\_of\_the\_award, year FROM Scientific\_awards WHERE (the\_name\_of\_the\_award LIKE '%Medal%' AND Scientific\_awards.year >= 1892) ORDER BY year;

До оптимизации:

QUERY PLAN

---------------------------------------------------------------------------------------------------------------------

Sort (cost=1.28..1.28 rows=1 width=182) (actual time=23.764..23.766 rows=5 loops=1)

Sort Key: year

Sort Method: quicksort Memory: 25kB

-> Seq Scan on scientific\_awards (cost=0.00..1.27 rows=1 width=182) (actual time=23.710..23.723 rows=5 loops=1)

Filter: (((the\_name\_of\_the\_award)::text ~~ '%Medal%'::text) AND (year >= 1892))

Rows Removed by Filter: 13

Planning time: 91.165 ms

Execution time: 23.821 ms

(8 строк)

Создание индекса: создаем индекс по году (год, в котором была впервые присуждена та или иная награда)

CREATE INDEX ON Scientific\_awards (year);

EXPLAIN (ANALYZE) SELECT the\_name\_of\_the\_award, year FROM Scientific\_awards WHERE (the\_name\_of\_the\_award LIKE '%Medal%' AND Scientific\_awards.year >= 1892) ORDER BY year;

После оптимизации:

QUERY PLAN

-------------------------------------------------------------------------------------------------------------------

Sort (cost=1.28..1.28 rows=1 width=182) (actual time=0.079..0.079 rows=5 loops=1)

Sort Key: year

Sort Method: quicksort Memory: 25kB

-> Seq Scan on scientific\_awards (cost=0.00..1.27 rows=1 width=182) (actual time=0.048..0.058 rows=5 loops=1)

Filter: (((the\_name\_of\_the\_award)::text ~~ '%Medal%'::text) AND (year >= 1892))

Rows Removed by Filter: 13

Planning time: 1.196 ms

Execution time: 0.123 ms

(8 строк)

4) Вывести 3 самых молодых ученых, рожденных в 19 веке, их возраст и их альма-матер, в названии которого содержится слово University

SELECT name\_and\_surname, alma\_mater, age(date\_of\_death,date\_of\_birth) FROM Scientists WHERE (alma\_mater LIKE '%University%' AND Scientists.date\_of\_birth > '1800-01-01' AND Scientists.date\_of\_birth < '1901-01-01') ORDER BY age LIMIT 3;

До оптимизации:

QUERY PLAN

--------------------------------------------------------------------------------------------------------------------------------------------------------

Limit (cost=1.28..1.28 rows=1 width=372) (actual time=7.643..7.644 rows=3 loops=1)

-> Sort (cost=1.28..1.28 rows=1 width=372) (actual time=7.638..7.639 rows=3 loops=1)

Sort Key: (age((date\_of\_death)::timestamp with time zone, (date\_of\_birth)::timestamp with time zone))

Sort Method: quicksort Memory: 25kB

-> Seq Scan on scientists (cost=0.00..1.27 rows=1 width=372) (actual time=0.115..0.134 rows=5 loops=1)

Filter: (((alma\_mater)::text ~~ '%University%'::text) AND (date\_of\_birth > '1800-01-01'::date) AND (date\_of\_birth < '1901-01-01'::date))

Rows Removed by Filter: 10

Planning time: 15.132 ms

Execution time: 13.509 ms

(9 строк)

Создание индекса: создаем индекс по дате рождения учёного

CREATE INDEX ON Scientists (date\_of\_birth);

EXPLAIN (ANALYZE) SELECT name\_and\_surname, alma\_mater, age(date\_of\_death,date\_of\_birth) FROM Scientists WHERE (alma\_mater LIKE '%University%' AND Scientists.date\_of\_birth > '1800-01-01' AND Scientists.date\_of\_birth < '1901-01-01') ORDER BY age LIMIT 3;

После оптимизации:

QUERY PLAN

--------------------------------------------------------------------------------------------------------------------------------------------------------

Limit (cost=1.28..1.28 rows=1 width=372) (actual time=0.088..0.089 rows=3 loops=1)

-> Sort (cost=1.28..1.28 rows=1 width=372) (actual time=0.087..0.088 rows=3 loops=1)

Sort Key: (age((date\_of\_death)::timestamp with time zone, (date\_of\_birth)::timestamp with time zone))

Sort Method: quicksort Memory: 25kB

-> Seq Scan on scientists (cost=0.00..1.27 rows=1 width=372) (actual time=0.048..0.065 rows=5 loops=1)

Filter: (((alma\_mater)::text ~~ '%University%'::text) AND (date\_of\_birth > '1800-01-01'::date) AND (date\_of\_birth < '1901-01-01'::date))

Rows Removed by Filter: 10

Planning time: 0.789 ms

Execution time: 0.131 ms

(9 строк)

Средние запросы

1)Вывести всех ученых из Российской империи и их возраст и отсортировать их от младшего к старшему

SELECT name\_and\_surname, age(date\_of\_death,date\_of\_birth) FROM (Scientists INNER JOIN (Towns INNER JOIN Countries ON (Towns.id\_Country = Countries.id)) ON (Scientists.town\_of\_birth\_Id = Towns.id)) WHERE Countries.country ='Russian\_Empire' ORDER BY age;

До оптимизации:

QUERY PLAN

---------------------------------------------------------------------------------------------------------------------------------------------------------------

Sort (cost=36.20..36.21 rows=1 width=194) (actual time=0.325..0.326 rows=5 loops=1)

Sort Key: (age((scientists.date\_of\_death)::timestamp with time zone, (scientists.date\_of\_birth)::timestamp with time zone))

Sort Method: quicksort Memory: 25kB

-> Hash Join (cost=23.43..36.19 rows=1 width=194) (actual time=0.270..0.287 rows=5 loops=1)

Hash Cond: (scientists.town\_of\_birth\_id = towns.id)

-> Seq Scan on scientists (cost=0.00..12.00 rows=200 width=190) (actual time=0.030..0.034 rows=15 loops=1)

-> Hash (cost=23.41..23.41 rows=1 width=4) (actual time=0.104..0.104 rows=5 loops=1)

Buckets: 1024 Batches: 1 Memory Usage: 9kB

-> Hash Join (cost=8.18..23.41 rows=1 width=4) (actual time=0.070..0.080 rows=5 loops=1)

Hash Cond: (towns.id\_country = countries.id)

-> Seq Scan on towns (cost=0.00..13.80 rows=380 width=8) (actual time=0.014..0.016 rows=15 loops=1)

-> Hash (cost=8.17..8.17 rows=1 width=4) (actual time=0.040..0.040 rows=1 loops=1)

Buckets: 1024 Batches: 1 Memory Usage: 9kB

-> Index Scan using countries\_country\_key on countries (cost=0.15..8.17 rows=1 width=4) (actual time=0.034..0.035 rows=1 loops=1)

Index Cond: ((country)::text = 'Russian\_Empire'::text)

Planning time: 34.404 ms

Execution time: 0.576 ms

(17 строк)

Создание индекса: создание индекса по стране

CREATE INDEX ON Countries (country);

EXPLAIN (ANALYZE) SELECT name\_and\_surname, age(date\_of\_death,date\_of\_birth) FROM (Scientists INNER JOIN (Towns INNER JOIN Countries ON (Towns.id\_Country = Countries.id)) ON (Scientists.town\_of\_birth\_Id = Towns.id)) WHERE Countries.country ='Russian\_Empire' ORDER BY age;

После оптимизации:

QUERY PLAN

-------------------------------------------------------------------------------------------------------------------------------

Sort (cost=17.90..17.90 rows=1 width=194) (actual time=0.320..0.323 rows=5 loops=1)

Sort Key: (age((scientists.date\_of\_death)::timestamp with time zone, (scientists.date\_of\_birth)::timestamp with time zone))

Sort Method: quicksort Memory: 25kB

-> Hash Join (cost=2.52..17.89 rows=1 width=194) (actual time=0.247..0.290 rows=5 loops=1)

Hash Cond: (towns.id = scientists.town\_of\_birth\_id)

-> Hash Join (cost=1.19..16.43 rows=27 width=4) (actual time=0.117..0.138 rows=5 loops=1)

Hash Cond: (towns.id\_country = countries.id)

-> Seq Scan on towns (cost=0.00..13.80 rows=380 width=8) (actual time=0.029..0.037 rows=15 loops=1)

-> Hash (cost=1.18..1.18 rows=1 width=4) (actual time=0.069..0.069 rows=1 loops=1)

Buckets: 1024 Batches: 1 Memory Usage: 9kB

-> Seq Scan on countries (cost=0.00..1.18 rows=1 width=4) (actual time=0.054..0.064 rows=1 loops=1)

Filter: ((country)::text = 'Russian\_Empire'::text)

Rows Removed by Filter: 13

-> Hash (cost=1.15..1.15 rows=15 width=190) (actual time=0.094..0.094 rows=15 loops=1)

Buckets: 1024 Batches: 1 Memory Usage: 9kB

-> Seq Scan on scientists (cost=0.00..1.15 rows=15 width=190) (actual time=0.045..0.059 rows=15 loops=1)

Planning time: 1.992 ms

Execution time: 0.453 ms

(18 строк)

2) Вывести ученых, которые имеют британские награды, которые впервые были присуждены в период с 1813 по 1850 года, а также название этой награды и год первого присуждения

SELECT name\_and\_surname, the\_name\_of\_the\_award, year FROM (Countries INNER JOIN (Scientific\_awards AS sa INNER JOIN (Scientists\_Scientific\_awards\_relation AS ssar INNER JOIN Scientists ON (ssar.id\_scientist = Scientists.id)) ON (ssar.id\_scientific\_award = sa.id)) ON (sa.country\_id= Countries.id)) WHERE (Countries. country='Britain' AND (year >= '1813' AND year <= '1850'));

До оптимизации:

QUERY PLAN

-------------------------------------------------------------------------------------------------------------------------------

Sort (cost=17.90..17.90 rows=1 width=194) (actual time=0.506..0.507 rows=5 loops=1)

Sort Key: (age((scientists.date\_of\_death)::timestamp with time zone, (scientists.date\_of\_birth)::timestamp with time zone))

Sort Method: quicksort Memory: 25kB

-> Hash Join (cost=2.52..17.89 rows=1 width=194) (actual time=0.242..0.268 rows=5 loops=1)

Hash Cond: (towns.id = scientists.town\_of\_birth\_id)

-> Hash Join (cost=1.19..16.43 rows=27 width=4) (actual time=0.091..0.106 rows=5 loops=1)

Hash Cond: (towns.id\_country = countries.id)

-> Seq Scan on towns (cost=0.00..13.80 rows=380 width=8) (actual time=0.022..0.024 rows=15 loops=1)

-> Hash (cost=1.18..1.18 rows=1 width=4) (actual time=0.044..0.044 rows=1 loops=1)

Buckets: 1024 Batches: 1 Memory Usage: 9kB

-> Seq Scan on countries (cost=0.00..1.18 rows=1 width=4) (actual time=0.028..0.034 rows=1 loops=1)

Filter: ((country)::text = 'Russian\_Empire'::text)

Rows Removed by Filter: 13

-> Hash (cost=1.15..1.15 rows=15 width=190) (actual time=0.064..0.064 rows=15 loops=1)

Buckets: 1024 Batches: 1 Memory Usage: 9kB

-> Seq Scan on scientists (cost=0.00..1.15 rows=15 width=190) (actual time=0.031..0.038 rows=15 loops=1)

Planning time: 3.371 ms

Execution time: 0.707 ms

(18 строк)

Создание индекса: создаем индекс по году (год, в котором была впервые присуждена та или иная награда)

CREATE INDEX ON Scientific\_awards (year);

EXPLAIN (ANALYZE) SELECT name\_and\_surname, the\_name\_of\_the\_award, year FROM (Countries INNER JOIN (Scientific\_awards AS sa INNER JOIN (Scientists\_Scientific\_awards\_relation AS ssar INNER JOIN Scientists ON (ssar.id\_scientist = Scientists.id)) ON (ssar.id\_scientific\_award = sa.id)) ON (sa.country\_id= Countries.id)) WHERE (Countries.country='Britain' AND (year >= '1813' AND year <= '1850'));

После оптимизации:

QUERY PLAN

-----------------------------------------------------------------------------------------------------------------------------------------------------

Hash Join (cost=3.81..42.46 rows=113 width=360) (actual time=0.226..0.237 rows=3 loops=1)

Hash Cond: (ssar.id\_scientist = scientists.id)

-> Hash Join (cost=2.47..40.62 rows=113 width=186) (actual time=0.095..0.105 rows=3 loops=1)

Hash Cond: (ssar.id\_scientific\_award = sa.id)

-> Seq Scan on scientists\_scientific\_awards\_relation ssar (cost=0.00..30.40 rows=2040 width=8) (actual time=0.018..0.023 rows=27 loops=1)

-> Hash (cost=2.46..2.46 rows=1 width=186) (actual time=0.066..0.066 rows=3 loops=1)

Buckets: 1024 Batches: 1 Memory Usage: 9kB

-> Nested Loop (cost=0.00..2.46 rows=1 width=186) (actual time=0.048..0.058 rows=3 loops=1)

Join Filter: (countries.id = sa.country\_id)

Rows Removed by Join Filter: 2

-> Seq Scan on countries (cost=0.00..1.18 rows=1 width=4) (actual time=0.023..0.025 rows=1 loops=1)

Filter: ((country)::text = 'Britain'::text)

Rows Removed by Filter: 13

-> Seq Scan on scientific\_awards sa (cost=0.00..1.27 rows=1 width=190) (actual time=0.021..0.025 rows=5 loops=1)

Filter: ((year >= 1813) AND (year <= 1850))

Rows Removed by Filter: 13

-> Hash (cost=1.15..1.15 rows=15 width=182) (actual time=0.107..0.107 rows=15 loops=1)

Buckets: 1024 Batches: 1 Memory Usage: 9kB

-> Seq Scan on scientists (cost=0.00..1.15 rows=15 width=182) (actual time=0.083..0.090 rows=15 loops=1)

Planning time: 0.985 ms

Execution time: 0.393 ms

(21 строка)

3) Вывести достижения, открытые учеными, у которых сфера деятельности – математика и которые родились после 01.01.1800, а также указать этих ученых, место и год публикации

SELECT discovery, name\_and\_surname, place AS place\_of\_publication, year AS year\_of\_publication FROM (Scientific\_spheres AS ss INNER JOIN (Scientists\_Spheres\_relation AS ssr INNER JOIN (Scientists INNER JOIN (Scientists\_Discoveries\_relation AS sdr INNER JOIN Discoveries ON (sdr.id\_scientist\_discovery = Discoveries.id)) ON (sdr.id\_scientist = Scientists.id)) ON (ssr.id\_scientist = Scientists.id)) ON (ssr.id\_sphere\_of\_activity = ss.id)) WHERE (ss.scientific\_sphere = 'Mathematics' AND Scientists.date\_of\_birth >='1800-01-01') ORDER BY year\_of\_publication;

До оптимизации:

QUERY PLAN

------------------------------------------------------------------------------------------------------------------------------------------------------------------

Nested Loop (cost=42.25..1151.18 rows=10336 width=738) (actual time=0.487..0.498 rows=1 loops=1)

Join Filter: (sdr.id\_scientist = scientists.id)

Rows Removed by Join Filter: 27

-> Nested Loop (cost=42.25..976.36 rows=2315 width=568) (actual time=0.404..0.451 rows=2 loops=1)

Join Filter: (sdr.id\_scientist\_discovery = discoveries.id)

Rows Removed by Join Filter: 44

-> Index Scan using discoveries\_year\_idx on discoveries (cost=0.14..12.48 rows=23 width=564) (actual time=0.087..0.102 rows=23 loops=1)

-> Materialize (cost=42.11..170.99 rows=2315 width=12) (actual time=0.014..0.014 rows=2 loops=23)

-> Hash Join (cost=42.11..159.41 rows=2315 width=12) (actual time=0.300..0.307 rows=2 loops=1)

Hash Cond: (sdr.id\_scientist = ssr.id\_scientist)

-> Seq Scan on scientists\_discoveries\_relation sdr (cost=0.00..30.40 rows=2040 width=8) (actual time=0.056..0.059 rows=23 loops=1)

-> Hash (cost=39.27..39.27 rows=227 width=4) (actual time=0.215..0.215 rows=2 loops=1)

Buckets: 1024 Batches: 1 Memory Usage: 9kB

-> Hash Join (cost=1.13..39.27 rows=227 width=4) (actual time=0.194..0.199 rows=2 loops=1)

Hash Cond: (ssr.id\_sphere\_of\_activity = ss.id)

-> Seq Scan on scientists\_spheres\_relation ssr (cost=0.00..30.40 rows=2040 width=8) (actual time=0.017..0.019 rows=15 loops=1)

-> Hash (cost=1.11..1.11 rows=1 width=4) (actual time=0.149..0.149 rows=1 loops=1)

Buckets: 1024 Batches: 1 Memory Usage: 9kB

-> Seq Scan on scientific\_spheres ss (cost=0.00..1.11 rows=1 width=4) (actual time=0.129..0.132 rows=1 loops=1)

Filter: ((scientific\_sphere)::text = 'Mathematics'::text)

Rows Removed by Filter: 8

-> Materialize (cost=0.00..1.21 rows=5 width=182) (actual time=0.014..0.020 rows=14 loops=2)

-> Seq Scan on scientists (cost=0.00..1.19 rows=5 width=182) (actual time=0.020..0.025 rows=14 loops=1)

Filter: (date\_of\_birth >= '1800-01-01'::date)

Rows Removed by Filter: 1

Planning time: 7.472 ms

Execution time: 0.709 ms

(27 строк)

Создание индекса: создаем индекс по научной сфере

CREATE INDEX ON Scientific\_spheres (scientific\_sphere);

EXPLAIN (ANALYZE) SELECT discovery, name\_and\_surname, place AS place\_of\_publication, year AS year\_of\_publication FROM (Scientific\_spheres AS ss INNER JOIN (Scientists\_Spheres\_relation AS ssr INNER JOIN (Scientists INNER JOIN (Scientists\_Discoveries\_relation AS sdr INNER JOIN Discoveries ON (sdr.id\_scientist\_discovery = Discoveries.id)) ON (sdr.id\_scientist = Scientists.id)) ON (ssr.id\_scientist = Scientists.id)) ON (ssr.id\_sphere\_of\_activity = ss.id)) WHERE (ss.scientific\_sphere = 'Mathematics' AND Scientists.date\_of\_birth >='1800-01-01') ORDER BY year\_of\_publication;

После оптимизации:

QUERY PLAN

------------------------------------------------------------------------------------------------------------------------------------------------------------------

Nested Loop (cost=42.25..1151.18 rows=10336 width=738) (actual time=0.249..0.261 rows=1 loops=1)

Join Filter: (sdr.id\_scientist = scientists.id)

Rows Removed by Join Filter: 27

-> Nested Loop (cost=42.25..976.36 rows=2315 width=568) (actual time=0.166..0.214 rows=2 loops=1)

Join Filter: (sdr.id\_scientist\_discovery = discoveries.id)

Rows Removed by Join Filter: 44

-> Index Scan using discoveries\_year\_idx on discoveries (cost=0.14..12.48 rows=23 width=564) (actual time=0.022..0.036 rows=23 loops=1)

-> Materialize (cost=42.11..170.99 rows=2315 width=12) (actual time=0.006..0.007 rows=2 loops=23)

-> Hash Join (cost=42.11..159.41 rows=2315 width=12) (actual time=0.134..0.141 rows=2 loops=1)

Hash Cond: (sdr.id\_scientist = ssr.id\_scientist)

-> Seq Scan on scientists\_discoveries\_relation sdr (cost=0.00..30.40 rows=2040 width=8) (actual time=0.036..0.039 rows=23 loops=1)

-> Hash (cost=39.27..39.27 rows=227 width=4) (actual time=0.079..0.079 rows=2 loops=1)

Buckets: 1024 Batches: 1 Memory Usage: 9kB

-> Hash Join (cost=1.13..39.27 rows=227 width=4) (actual time=0.068..0.074 rows=2 loops=1)

Hash Cond: (ssr.id\_sphere\_of\_activity = ss.id)

-> Seq Scan on scientists\_spheres\_relation ssr (cost=0.00..30.40 rows=2040 width=8) (actual time=0.015..0.019 rows=15 loops=1)

-> Hash (cost=1.11..1.11 rows=1 width=4) (actual time=0.034..0.034 rows=1 loops=1)

Buckets: 1024 Batches: 1 Memory Usage: 9kB

-> Seq Scan on scientific\_spheres ss (cost=0.00..1.11 rows=1 width=4) (actual time=0.024..0.026 rows=1 loops=1)

Filter: ((scientific\_sphere)::text = 'Mathematics'::text)

Rows Removed by Filter: 8

-> Materialize (cost=0.00..1.21 rows=5 width=182) (actual time=0.013..0.020 rows=14 loops=2)

-> Seq Scan on scientists (cost=0.00..1.19 rows=5 width=182) (actual time=0.020..0.026 rows=14 loops=1)

Filter: (date\_of\_birth >= '1800-01-01'::date)

Rows Removed by Filter: 1

Planning time: 2.408 ms

Execution time: 0.410 ms

(27 строк)

Сложные запросы

1) Вывести всех ученых, которые работали в самой популярной сфере и у которых есть американские награды, написать название этих наград

SELECT name\_and\_surname, the\_name\_of\_the\_award FROM **(**Countries INNER JOIN (Scientific\_awards AS sa INNER JOIN (Scientists\_Scientific\_awards\_relation AS ssar INNER JOIN (Scientists AS sct LEFT JOIN ( Scientific\_spheres AS ss LEFT JOIN Scientists\_Spheres\_relation AS ssr ON (ss.id = ssr.id\_sphere\_of\_activity)) ON (ssr. id\_scientist = sct.id)) ON (ssar.id\_scientist = sct.id)) ON (ssar.id\_scientific\_award =sa.id)) ON (sa.country\_id= Countries.id)) WHERE Countries. country='USA' AND scientific\_sphere = (SELECT scientific\_sphere FROM (Scientific\_spheres AS ss LEFT JOIN (Scientists\_Spheres\_relation AS ssr LEFT JOIN Scientists AS sct ON (ssr. id\_scientist = sct.id)) ON (ss.id = ssr.id\_sphere\_of\_activity)) GROUP BY ss.scientific\_sphere ORDER BY count(sct.id) DESC LIMIT 1);

2)Вывести количество достижений, которые открыли ученые из Российской империи, имеющие немецкие награды, учреждённые с 1900 года

WITH m1 AS ( SELECT discovery,name\_and\_surname FROM (Discoveries AS disc LEFT JOIN(Scientists\_Discoveries\_relation AS sdr LEFT JOIN (Scientists AS sct LEFT JOIN (Towns LEFT JOIN Countries ON (Towns.id\_Country = Countries.id)) ON (sct.town\_of\_birth\_Id = Towns.id )) ON (sdr.id\_scientist = sct.id)) ON (disc.id = sdr.id\_scientist\_discovery AND country ='Russian\_Empire'))), m2 AS (SELECT name\_and\_surname FROM (Countries INNER JOIN (Scientific\_awards AS sa INNER JOIN (Scientists\_Scientific\_awards\_relation AS ssar INNER JOIN Scientists AS sct ON (ssar.id\_scientist = sct.id)) ON (ssar.id\_scientific\_award = sa.id)) ON (sa.country\_id= Countries.id AND country='Germany' AND year >= '1900'))) SELECT count(discovery) FROM m1 WHERE name\_and\_surname IN (SELECT name\_and\_surname FROM m2);

3) Вывести все награды, в названии которых содержится слово Medal и которые имеют ученые, у которых научная сфера входит в тройку самых популярных сфер из имеющихся и которые сделали открытия после 1800 года, также вывести имена и фамилии этих ученых

WITH g1 AS (SELECT name\_and\_surname, the\_name\_of\_the\_award FROM **(**Scientific\_awards AS sa INNER JOIN (Scientists\_Scientific\_awards\_relation AS ssar INNER JOIN (Scientists AS sct LEFT JOIN ( Scientific\_spheres AS ss LEFT JOIN Scientists\_Spheres\_relation AS ssr ON (ss.id = ssr.id\_sphere\_of\_activity)) ON (ssr. id\_scientist = sct.id)) ON (ssar.id\_scientist = sct.id)) ON (ssar.id\_scientific\_award =sa.id AND the\_name\_of\_the\_award LIKE '%Medal%' AND scientific\_sphere IN (SELECT scientific\_sphere FROM (Scientific\_spheres AS ss LEFT JOIN (Scientists\_Spheres\_relation AS ssr LEFT JOIN Scientists AS sct ON (ssr. id\_scientist = sct.id)) ON (ss.id = ssr.id\_sphere\_of\_activity)) GROUP BY ss.scientific\_sphere ORDER BY count(sct.id) DESC LIMIT 3)))), g2 AS (SELECT name\_and\_surname, discovery FROM ( Discoveries AS disc INNER JOIN( Scientists\_Discoveries\_relation AS sdr INNER JOIN Scientists AS sct ON(sdr.id\_scientist = sct.id)) ON (disc.id = sdr.id\_scientist\_discovery)) WHERE disc.year >= '1900') SELECT the\_name\_of\_the\_award, name\_and\_surname FROM g1 WHERE name\_and\_surname IN (SELECT name\_and\_surname FROM g2) ORDER BY name\_and\_surname;