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федеральное государственное автономное образовательное учреждение
высшего образования
«НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ ИТМО»

Отчет
по лабораторной работе 2
«Запросы на выборку и модификацию данных,
представления и индексы в PostgreSQL»
по дисциплине **«Проектирование и реализация баз данных»**
Вариант 3

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Дата: 10.08.2023

Цель работы: овладеть практическими навыками создания представлений и запросов на выборку данных к базе данных PostgreSQL, использования подзапросов при модификации данных и индексов.

Программное обеспечение: СУБД PostgreSQL 1X, pgAdmin 4

Практическое задание:

Вариант 3. БД «Библиотека»

1. Вывести список читателей, имеющих на руках книги, переведенные с английского языка, изданные позднее 2000 года.
2. Вывести список читателей, не вернувших в срок книги и имеющих на руках более десяти книг.
3. Найти количество читателей, не вернувших в срок книги и имеющих на руках более десяти книг.
4. Вывести список книг, которые находятся в библиотеке в единственном экземпляре.
5. Подсчитать количество читателей, которые не обращались в библиотеку в течение года.
6. Подсчитать количество читателей библиотеки по уровню образования.
7. Вывести список книг по программированию на C#, экземпляры которых отсутствуют в библиотеке, и которые должны быть возвращены не позднее, чем через 3 дня.

Выполнение:

Задание 1. Создайте запросы.

Запрос №1 - Вывести список читателей, имеющих на руках книги, переведенные с английского языка, изданные позднее 2000 года.

```
SELECT full_name
FROM "library"."reader"
LEFT JOIN "library"."reader_card" t
ON ("reader".reader_id = t.reader_id)
LEFT JOIN "library"."subscription" a
ON (t.card_id = a.card_id)
LEFT JOIN "library"."book_book_copy"
ON ("book_book_copy".book_copy_id = a.book_copy_id)
LEFT JOIN "library"."edition"
ON ("edition".edition_id = "book_book_copy".edition_id)
LEFT JOIN "library"."book_info"
ON ("book_info".book_id = "edition".book_id)
WHERE "edition".edition_date > '2000-12-31'::date
AND "book_info".original_language = 'английский'
```

pgAdmin 4

File Object Tools Help

Object Explorer

- FTS Templates
- Foreign Tables
- Functions
- Materialized Views
- Operators
- Procedures
- Sequences
- Tables (16)
 - accounting_act
 - acquisition
 - book_copy
 - book_info
 - edition
 - employee
 - gift_replace_act
 - invoice
 - operation
 - publisher
 - reader
 - reader_card
 - storage
 - stored
 - subscription
 - write_off_act
- Trigger Functions
- Types
- Views
- Subscriptions
- postgres
- Login/Group Roles
- Tablespaces

Properties SQL library.subscription library.edition/L... library/postgres@PostgreSQL 15* library.book_co...

library/postgres@PostgreSQL 15

Query Query History

```
1 SELECT full_name
2 FROM "library"."reader"
3 LEFT JOIN "library"."reader_card" t
4 ON ("reader".reader_id = t.reader_id)
5 LEFT JOIN "library"."subscription" a
6 ON (t.card_id = a.card_id)
7 LEFT JOIN "library"."book_copy"
8 ON ("book_copy".copy_id = a.copy_id)
9 LEFT JOIN "library"."edition"
10 ON ("edition".edition_id = "book_copy".edition_id)
11 LEFT JOIN "library"."book_info"
12 ON ("book_info".book_id = "edition".book_id)
13 WHERE "edition".edition_date > DATE('2000-12-31')
14 AND "book_info".original_language = 'АНГЛИЙСКИЙ'
```

Data Output Messages Notifications

	fullName
1	Алексей Лызов

Total rows: 1 of 1 Query complete 00:00:00.050

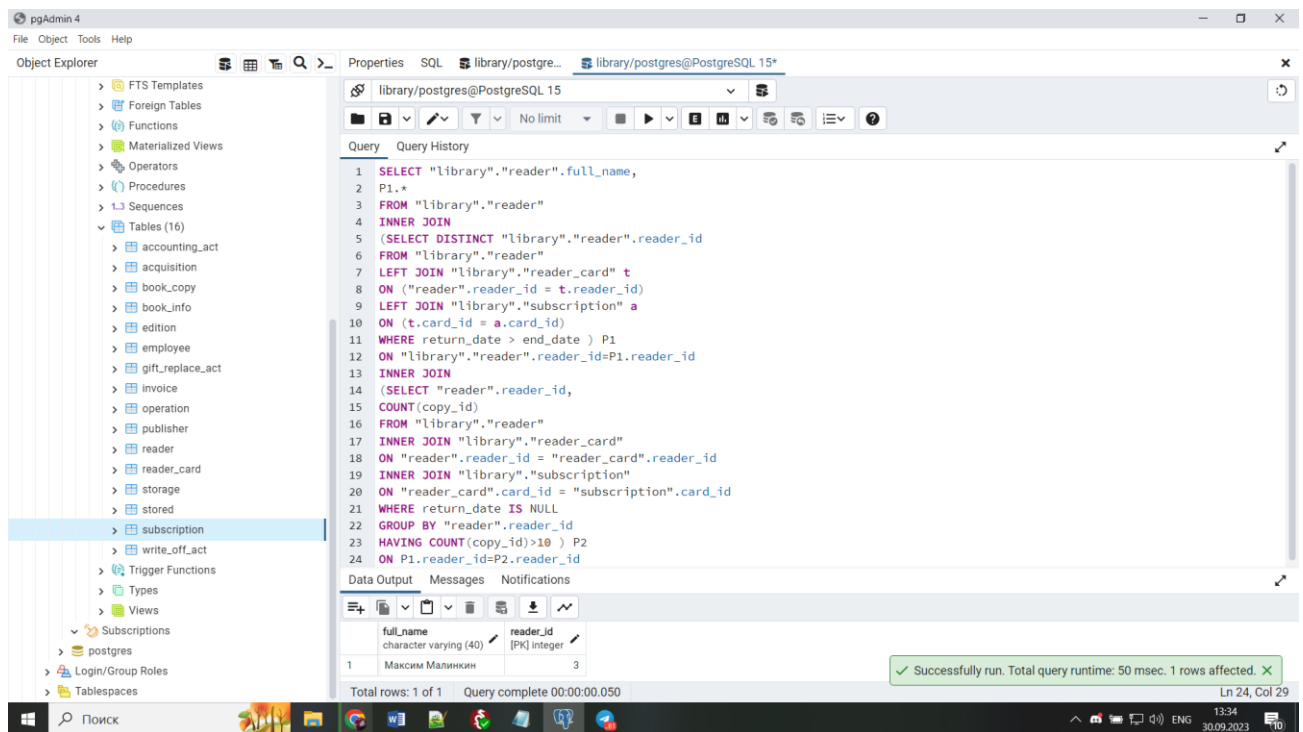
Ln 14, Col 49

13:23 30.09.2023

Получено успешно. Total query runtime: 50 msec. 1 rows affected.

Запрос №2 - Вывести список читателей, не вернувших в срок книги и имеющих на руках более десяти книг

```
SELECT "library"."reader".full_name,  
P1.*  
FROM "library"."reader"  
INNER JOIN  
(SELECT DISTINCT "library"."reader".reader_id  
FROM "library"."reader"  
LEFT JOIN "library"."reader_card" t  
ON ("reader".reader_id = t.reader_id)  
LEFT JOIN "library"."subscription" a  
ON (t.card_id = a.card_id)  
WHERE return_date > end_date ) P1  
ON "library"."reader".reader_id=P1.reader_id  
INNER JOIN  
(SELECT "reader".reader_id,  
COUNT(book_copy_id)  
FROM "library"."reader"  
INNER JOIN "library"."reader_card"  
ON "reader".reader_id = "reader_card".reader_id  
INNER JOIN "library"."subscription"  
ON "reader_card".card_id = "subscription".card_id  
WHERE return_date IS NULL  
GROUP BY "reader".reader_id  
HAVING COUNT(book_copy_id)>10 ) P2  
ON P1.reader_id=P2.reader_id
```



Запрос №3 - Найти количество читателей, не вернувших в срок книги и имеющих на руках более десяти книг.

```

SELECT P2.*
FROM "library"."reader"
INNER JOIN
(SELECT DISTINCT "library"."reader".reader_id
FROM "library"."reader"
LEFT JOIN "library"."reader_card" t
ON ("reader".reader_id = t.reader_id)
LEFT JOIN "library"."subscription" a
ON (t.card_id = a.card_id)
WHERE return_date > end_date ) P1
ON "library"."reader".reader_id=P1.reader_id
INNER JOIN
(SELECT "reader".reader_id,
COUNT(book_copy_id)
FROM "library"."reader"
INNER JOIN "library"."reader_card"
ON "reader".reader_id = "reader_card".reader_id

```

INNER JOIN "library"."subscription"

ON "reader_card".card_id = "subscription".card_id

WHERE return_date IS NULL

GROUP BY "reader".reader_id

HAVING COUNT(book_copy_id)>10) P2

ON P1.reader_id=P2.reader_id

The screenshot shows the pgAdmin 4 interface with a SQL query editor and a data output window. The query is a complex join involving multiple tables: library.reader, library.reader_card, library.subscription, and library.book_copy. It filters for records where return_date is NULL and groups by reader_id, keeping only those with more than 10 book copies. The query is then joined with a subquery P2 that filters for specific reader_ids.

```
1 SELECT P2.*
2 FROM "library"."reader"
3 INNER JOIN
4 (SELECT DISTINCT "library"."reader".reader_id
5 FROM "library"."reader"
6 LEFT JOIN "library"."reader_card" t
7 ON ("reader".reader_id = t.reader_id)
8 LEFT JOIN "library"."subscription" a
9 ON (t.card_id = a.card_id)
10 WHERE return_date > end_date ) P1
11 ON "library"."reader".reader_id=P1.reader_id
12 INNER JOIN
13 (SELECT "reader".reader_id,
14 COUNT(copy_id)
15 FROM "library"."reader"
16 INNER JOIN "library"."reader_card"
17 ON "reader".reader_id = "reader_card".reader_id
18 INNER JOIN "library"."subscription"
19 ON "reader_card".card_id = "subscription".card_id
20 WHERE return_date IS NULL
21 GROUP BY "reader".reader_id
22 HAVING COUNT(copy_id)>10 ) P2
23 ON P1.reader_id=P2.reader_id
24
```

The data output window shows a single row of results:

reader_id [PK] integer	count bigint
1	11

At the bottom, a green status bar indicates: "Successfully run. Total query runtime: 54 msec. 1 rows affected."

Запрос №4 - Вывести список книг, которые находятся в библиотеке в единственном экземпляре.

```
SELECT book_name, book_author
FROM "library"."book_book_copy"
LEFT JOIN "library"."edition"
ON ("edition".edition_id = "book_book_copy".edition_id)
LEFT JOIN "library"."book_info"
ON ("book_info".book_id = "edition".book_id)
GROUP BY book_name, book_author
HAVING COUNT("book_book_copy".book_copy_id) = 1
```

The screenshot shows the pgAdmin 4 interface. On the left, the Object Explorer displays the database structure, including tables like 'book_book_copy', 'edition', and 'book_info'. The 'book_book_copy' table is selected, showing its columns: book_id, book_name, field_of_knowledge, original_language, book_author, and type. The main pane displays the SQL query:

```
1 SELECT book_name, book_author
2 FROM "library"."book_book_copy"
3 LEFT JOIN "library"."edition"
4 ON ("edition".edition_id = "book_book_copy".edition_id)
5 LEFT JOIN "library"."book_info"
6 ON ("book_info".book_id = "edition".book_id)
7 GROUP BY book_name, book_author
8 HAVING COUNT("book_book_copy".copy_id) = 1
```

Below the query, the Data Output pane shows the results of the query:

	book_name	book_author
1	Три товарища	Эрих Мария Ремарк
2	Преступление и наказание	Ф.М. Достоевский

At the bottom, a status bar indicates: 'Total rows: 2 of 2', 'Query complete 00:00:00.132', and a green message: 'Successfully run. Total query runtime: 132 msec. 2 rows affected.'

Запрос №5 - Подсчитать количество читателей, которые не обращались в библиотеку в течение года.

```
SELECT full_name
FROM "library"."reader"
LEFT JOIN "library"."reader_card" t
ON ("reader".reader_id = t.reader_id)
LEFT JOIN "library"."subscription" a
ON (t.card_id = a.card_id)
WHERE start_date IS NULL
OR start_date < '2023.01.01'
```

The screenshot shows the pgAdmin 4 interface. The left pane displays the database structure, including the 'library' database and its various components like casts, catalogs, and tables. The central pane shows the SQL query being executed. The right pane displays the query results in a table format.

Query:

```
1 SELECT full_name
2 FROM "library"."reader"
3 LEFT JOIN "library"."reader_card" t
4 ON ("reader".reader_id = t.reader_id)
5 LEFT JOIN "library"."subscription" a
6 ON (t.card_id = a.card_id)
7 WHERE start_date IS NULL
8 OR start_date < '2023.01.01'
```

Data Output:

full_name
Максим Малинкин
Максим Малинкин
Максим Малинкин
Максим Малинкин
Максим Малинкин
Максим Малинкин
Максим Малинкин
Максим Малинкин
Максим Малинкин
Максим Малинкин
Максим Малинкин
Максим Малинкин

Successfully run. Total query runtime: 54 msec. 12 rows affected.

Запрос №6 - Подсчитать количество читателей библиотеки по уровню образования.

SELECT education_level,

COUNT(reader_id)

FROM "library"."reader"

GROUP BY education_level

The screenshot shows the pgAdmin 4 interface. On the left, the 'Object Explorer' pane displays a tree structure of database objects, with the 'reader' table under the 'library' database selected. The main pane shows the SQL query editor with the following query:

```
1 SELECT education_level,  
2 COUNT(reader_id)  
3 FROM "library"."reader"  
4 GROUP BY education_level
```

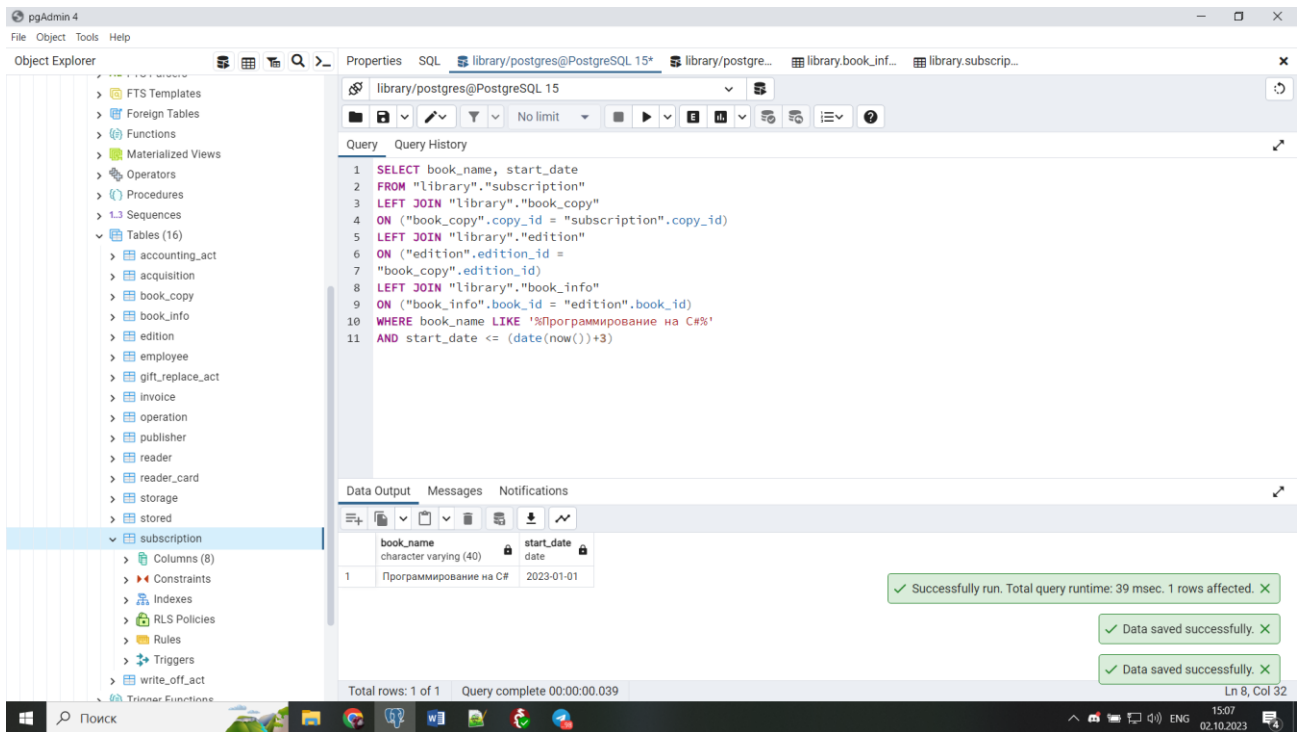
Below the query editor, the 'Data Output' tab is active, displaying the results of the query in a table format:

education_level	count
1	3
2	5
3	7

At the bottom of the interface, a status bar indicates 'Total rows: 3 of 3' and 'Query complete 00:00:00.048'. A green message box at the bottom right states 'Successfully run. Total query runtime: 48 msec. 3 rows affected.'

Запрос №7 - Вывести список книг по программированию на C#, экземпляры которых отсутствуют в библиотеке, и которые должны быть возвращены не позднее, чем через 3 дня.

```
SELECT book_name, start_date
FROM "library"."subscription"
LEFT JOIN "library"."book_copy"
ON ("book_copy".copy_id = "subscription".copy_id)
LEFT JOIN "library"."edition"
ON ("edition".edition_id =
"book_copy".edition_id)
LEFT JOIN "library"."book_info"
ON ("book_info".book_id = "edition".book_id)
WHERE book_name LIKE '%Программирование на C#%'
AND start_date <= (date(now())+3)
```



Задание 2. Создать представления для администрации библиотеки.

Представление №1 - сведения о должниках.

```
CREATE VIEW debtors AS
(SELECT "library"."reader".full_name,
P2.*
FROM "library"."reader"
INNER JOIN
(SELECT DISTINCT "library"."reader".reader_id
FROM "library"."reader"
LEFT JOIN "library"."reader_card" t
ON ("reader".reader_id = t.reader_id)
LEFT JOIN "library"."subscription" a
ON (t.card_id = a.card_id)
WHERE return_date > end_date ) P1
ON "library"."reader".reader_id=P1.reader_id
INNER JOIN
(SELECT "reader".reader_id,
COUNT(copy_id)
FROM "library"."reader"
INNER JOIN "library"."reader_card"
ON "reader".reader_id = "reader_card".reader_id
INNER JOIN "library"."subscription"
ON "reader_card".card_id = "subscription".card_id
GROUP BY "reader".reader_id
HAVING COUNT(copy_id)>=1 ) P2
ON P1.reader_id=P2.reader_id);SELECT *
FROM debtors
```

pgAdmin 4

File Object Tools Help

Object Explorer

- Servers
 - PostgreSQL 15
 - Databases (2)
 - library
 - Aggregates
 - Collations
 - Domains
 - FTS Configurations
 - FTS Dictionaries
 - FTS Parsers
 - FTS Templates
 - Foreign Tables
 - Functions
 - Materialized Views
 - Operators
 - Procedures
 - Sequences
 - Tables (16)
 - accounting_act
 - acquisition
 - book_copy
 - book_info

Properties SQL library/postgres@PostgreSQL 15*

library/postgres@PostgreSQL 15

No limit

Query Query History

```
1 CREATE VIEW debtors AS
2 (SELECT "library"."reader".full_name,
3 P2.*
4 FROM "library"."reader"
5 INNER JOIN
6 (SELECT DISTINCT "library"."reader".reader_id
7 FROM "library"."reader"
8 LEFT JOIN "library"."reader_card" t
9 ON ("reader".reader_id = t.reader_id)
10 LEFT JOIN "library"."subscription" a
11 ON (t.card_id = a.card_id)
12 WHERE return_date > end_date ) P1
13 ON "library"."reader".reader_id=P1.reader_id
14 INNER JOIN
15 (SELECT "reader".reader_id,
16 COUNT(copy_id)
17 FROM "library"."reader"
18 INNER JOIN "library"."reader_card"
19 ON "reader".reader_id = "reader_card".reader_id
20 INNER JOIN "library"."subscription"
21 ON "reader_card".card_id = "subscription".card_id
22 GROUP BY "reader".reader_id
23 HAVING COUNT(copy_id)>=1 ) P2
24 ON P1.reader_id=P2.reader_id);SELECT *
```

Data Output Messages Notifications

	full_name character varying (40)	reader_id integer	count bigint
1	Максим Малинкин	3	12

Total rows: 1 of 1 Query complete 00:00:00.184 Ln 25, Col 13

Поиск

1:16 03.10.2023

Представление №2 - сведения о наиболее популярных книгах (все экземпляры находятся на руках у читателей).

```
CREATE VIEW popular_books AS SELECT
"book_info".book_id,
"book_info".book_name
FROM "library"."book_info"
INNER JOIN
(SELECT "book_info".book_id,
count(copy_id) AS total
FROM "library"."book_info"
INNER JOIN "library"."edition"
ON "book_info".book_id="edition".book_id
INNER JOIN "library"."book_copy"
ON "edition".edition_id="book_copy".edition_id
GROUP BY "book_info".book_id ) ALL_BOOKS
ON ALL_BOOKS.book_id="book_info".book_id
LEFT JOIN
(SELECT "book_info".book_id,
COUNT(subscription_id) AS given
FROM "library"."book_info"
INNER JOIN "library"."edition"
ON "book_info".book_id="edition".book_id
INNER JOIN "library"."book_copy"
ON "edition".edition_id="book_copy".edition_id
INNER JOIN "library"."subscription"
ON "book_copy".copy_id="subscription".copy_id
WHERE "subscription".return_date IS NULL
GROUP BY "book_info".book_id )
GIVEN_BOOKS
ON ALL_BOOKS.book_id=GIVEN_BOOKS.book_id
WHERE total=coalesce(given,
0);SELECT *
FROM popular_books
```

pgAdmin 4

File Object Tools Help

Object Explorer

- Servers (1)
 - PostgreSQL 15
 - Databases (2)
 - library
 - Aggregates
 - Collations
 - Domains
 - FTS Configurations
 - FTS Dictionaries
 - FTS Parsers
 - FTS Templates
 - Foreign Tables
 - Functions
 - Materialized Views
 - Operators
 - Procedures
 - Sequences
 - Tables (16)
 - accounting_act
 - acquisition
 - book_copy
 - book_info

library/postgres@PostgreSQL 15

Query

```
1 CREATE VIEW popular_books AS SELECT
2 "book_info".book_id,
3 "book_info".book_name
4 FROM "library"."book_info"
5 INNER JOIN
6 (SELECT "book_info".book_id,
7 count(copy_id) AS total
8 FROM "library"."book_info"
9 INNER JOIN "library"."edition"
10 ON "book_info".book_id="edition".book_id
11 INNER JOIN "library"."book_copy"
12 ON
13 "edition".edition_id="book_copy".edition_id
14 GROUP BY "book_info".book_id ) ALL_BOOKS
15 ON ALL_BOOKS.book_id="book_info".book_id
16 LEFT JOIN
17 (SELECT "book_info".book_id,
18 COUNT(subscription_id) AS given
19 FROM "library"."book_info"
20 INNER JOIN "library"."edition"
21 ON "book_info".book_id="edition".book_id
```

Data Output

book_id	book_name
1	Степной Волк
2	Скотный двор
3	Программирование на C#

Total rows: 3 of 3 Query complete 00:00:00.049 Ln 33, Col 19

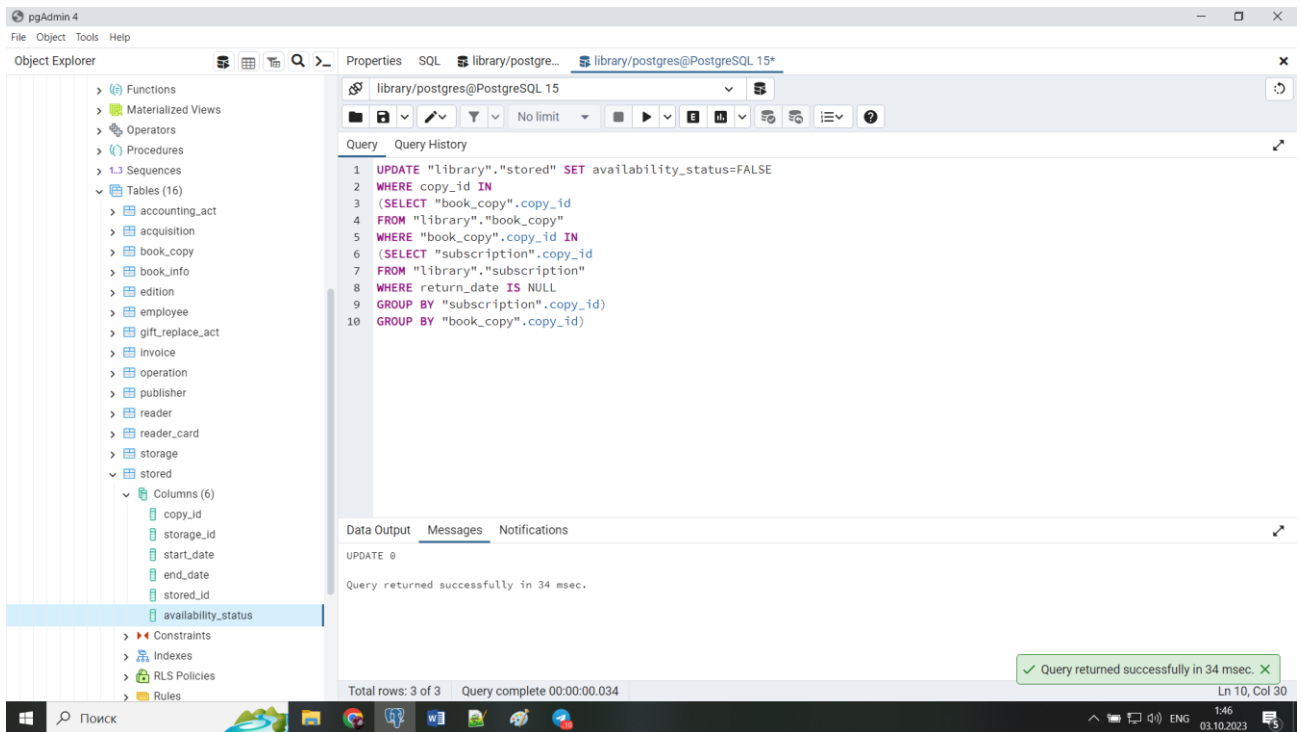
1:25 03.10.2023

Задание 3. Запросы на модификацию данных

Запрос 1. Update с подзапросом

Запрос: изменить статус на занято у тех книг, которые находятся на руках.

```
UPDATE "library"."stored" SET availability_status=FALSE
WHERE copy_id IN
(SELECT "book_copy".copy_id
FROM "library"."book_copy"
WHERE "book_copy".copy_id IN
(SELECT "subscription".copy_id
FROM "library"."subscription"
WHERE return_date IS NULL
GROUP BY "subscription".copy_id)
GROUP BY "book_copy".copy_id)
```



pgAdmin 4

File Object Tools Help

Object Explorer

- FTS Templates
- Foreign Tables
- Functions
- Materialized Views
- Operators
- Procedures
- Sequences
- Tables (16)
 - accounting_act
 - acquisition
 - book_copy
 - book_info
 - edition
 - employee
 - gift_replace_act
 - invoice
 - operation
 - publisher
 - reader
 - reader_card
 - storage**
 - stored
 - subscription
 - write_off_act
- Trigger Functions
- Types
- Views
- Subscriptions
- postgres
- Login/Group Roles
- Tablespaces

Properties SQL library/postgres@PostgreSQL 15* library.storage/... library.stored/li... library.subscrip...

library/postgres@PostgreSQL 15

Query Query History

```
1 SELECT * FROM "library"."stored"
2 ORDER BY stored_id ASC
```

Data Output Messages Notifications

copy_id	storage_id	start_date	end_date	stored_id	availability_status
integer	integer	date	date	[PK] integer	boolean
1	17	2010-01-01	2025-01-01	1	true

Total rows: 1 of 1 Query complete 00:00:00.054

Successfully run. Total query runtime: 54 msec. 1 rows affected.

Ln 2, Col 23

1:52 03.10.2023

Запрос 2. Delete с подзапросом

Запрос: удалить карту читателя, который суммарно получил штрафов больше 1000р.

DELETE

FROM "library"."reader_card"

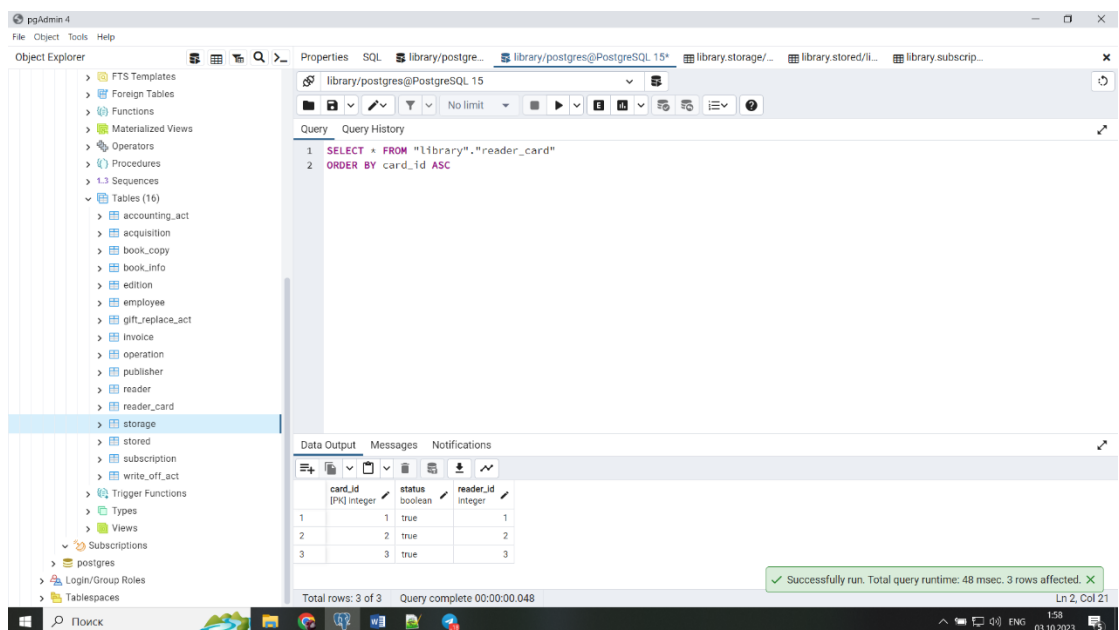
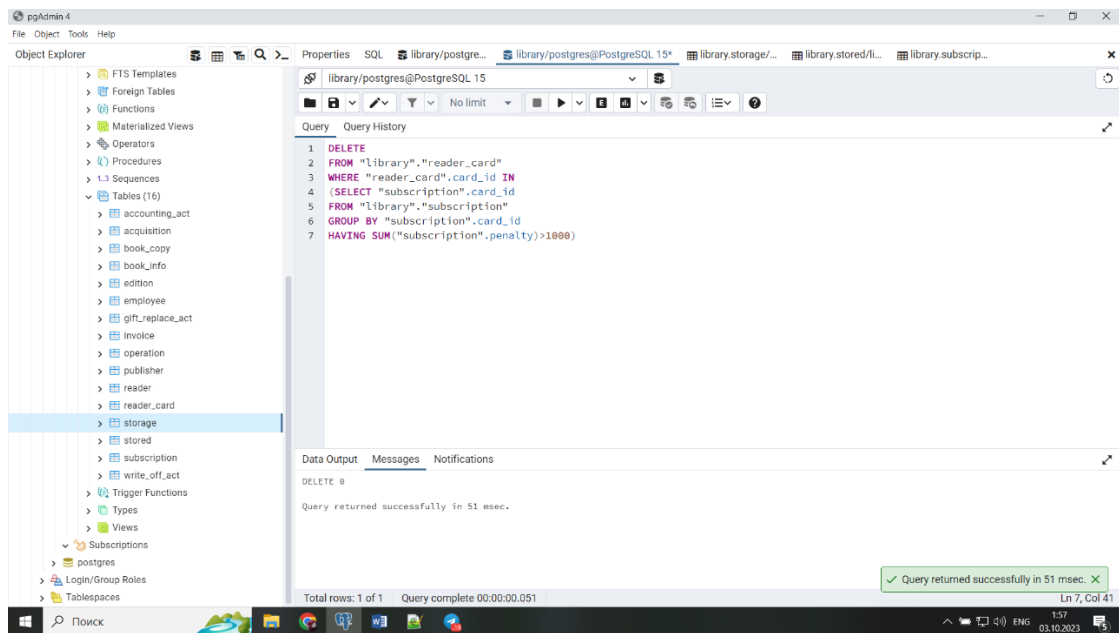
WHERE "reader_card".card_id IN

(SELECT "subscription".card_id

FROM "library"."subscription"

GROUP BY "subscription".card_id

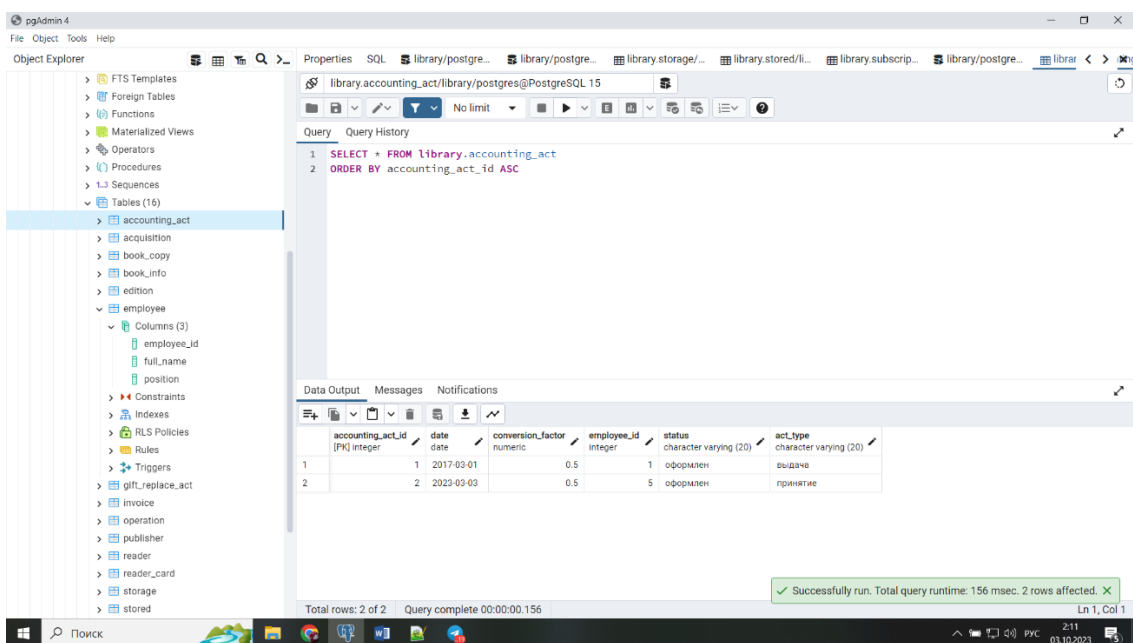
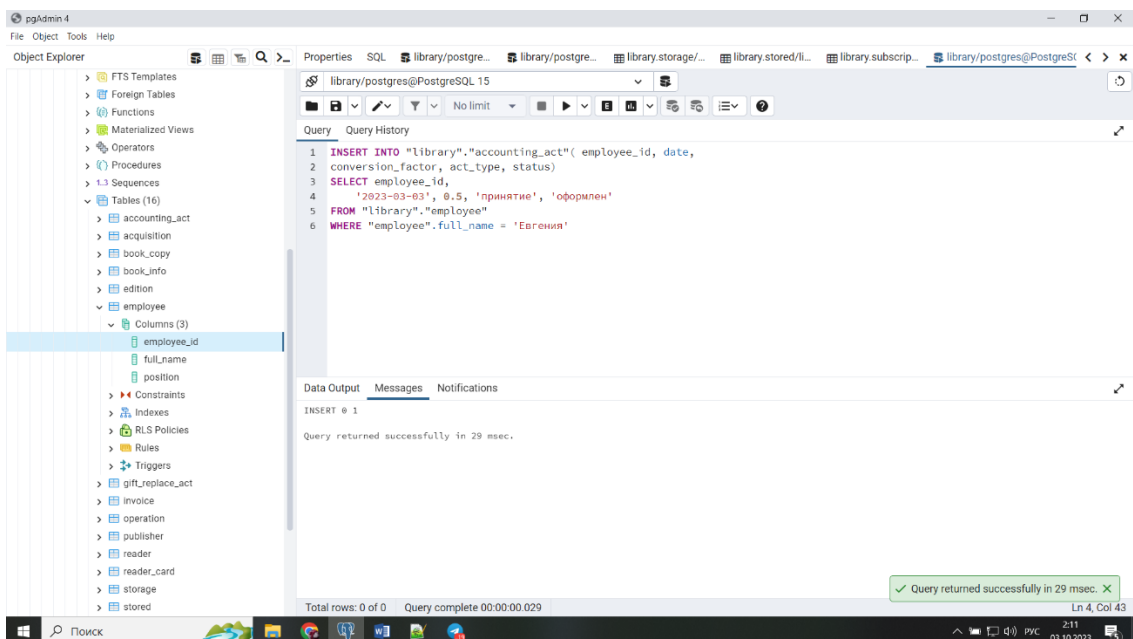
HAVING SUM("subscription".penalty)>1000)



Запрос 3. Insert с подзапросом

Запрос: добавить новый акт принятия книги, оформленный библиотекарем Евгенией сегодня.

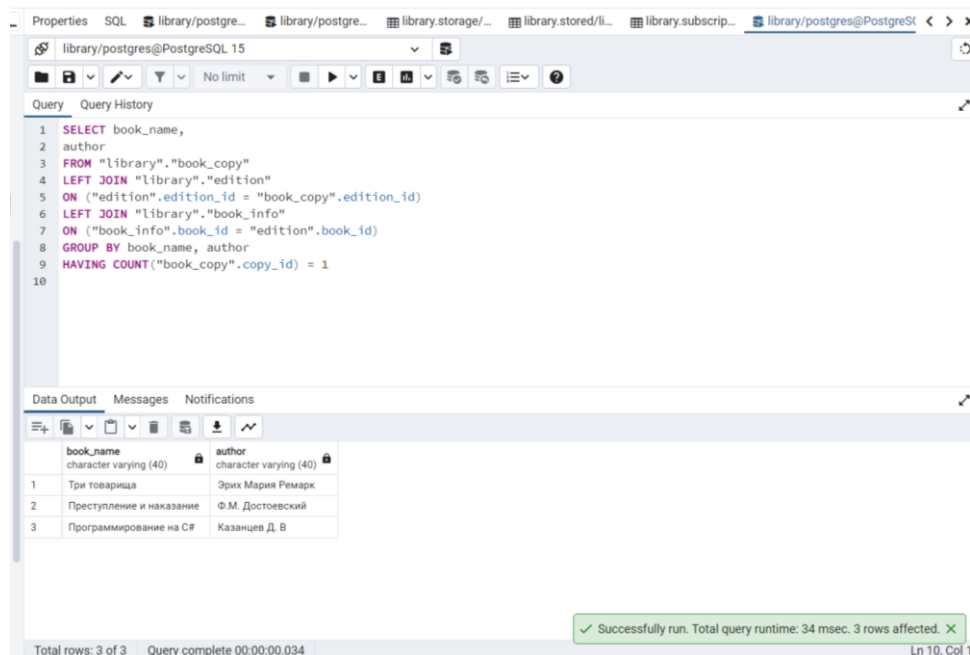
```
INSERT INTO "library"."accounting_act"( employee_id, date,  
conversion_factor, type, status)  
SELECT employee_id,  
'2023-03-10', 0.002, 'принятие', 'оформлен'  
FROM "library"."employee"  
WHERE "employee".full_name = 'Евгения'
```



Запрос 4. Индексы

1) Запрос без индекса.

```
SELECT book_name,  
author  
FROM "library"."book_copy"  
LEFT JOIN "library"."edition"  
ON ("edition".edition_id = "book_copy".edition_id)  
LEFT JOIN "library"."book_info"  
ON ("book_info".book_id = "edition".book_id)  
GROUP BY book_name, author  
HAVING COUNT("book_copy".copy_id) = 1
```



The screenshot shows a PostgreSQL query editor interface. The 'Query' tab displays the following SQL query:

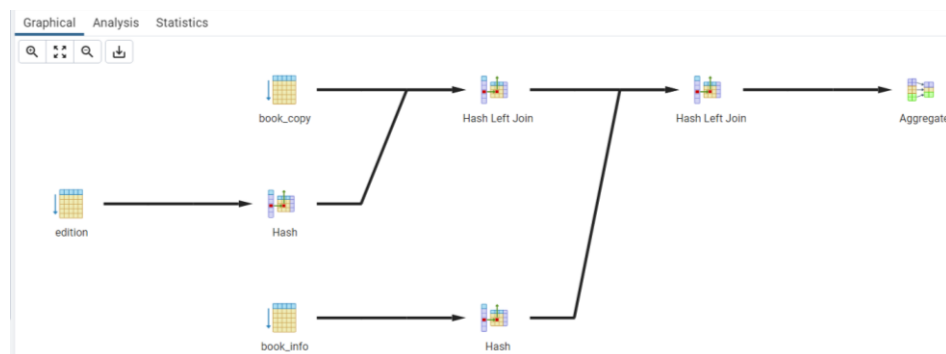
```
1 SELECT book_name,  
2 author  
3 FROM "library"."book_copy"  
4 LEFT JOIN "library"."edition"  
5 ON ("edition".edition_id = "book_copy".edition_id)  
6 LEFT JOIN "library"."book_info"  
7 ON ("book_info".book_id = "edition".book_id)  
8 GROUP BY book_name, author  
9 HAVING COUNT("book_copy".copy_id) = 1  
10
```

The 'Data Output' tab shows the results of the query, which are displayed in a table with two columns: book_name and author. The results are as follows:

book_name	author
Три товарища	Эрих Мария Ремарк
Преступление и наказание	Ф. М. Достоевский
Программирование на C#	Казанцев Д. В

The status bar at the bottom indicates: 'Total rows: 3 of 3 Query complete 00:00:00.034' and 'Successfully run. Total query runtime: 34 msec. 3 rows affected.'

План запроса в графическом виде:



План запроса в аналитическом виде:

Query

Query History

```

1 SELECT book_name,
2 author
3 FROM "library"."book_copy"
4 LEFT JOIN "library"."edition"
5 ON ("edition".edition_id = "book_copy".edition_id)

```

Data Output

Messages

Explain **x**

Notifications

Graphical

Analysis

Statistics

#	Node	Rows Actual	Loops
1.	→ Aggregate (rows=3 loops=1) Filter: (count(book_copy.copy_id) = 1) Rows Removed by Filter: 4 Buckets: Batches: Memory Usage: 121 kB	3	1
2.	→ Hash Left Join (rows=18 loops=1) Hash Cond: (edition.book_id = book_info.book_id)	18	1
3.	→ Hash Left Join (rows=18 loops=1) Hash Cond: (book_copy.edition_id = edition.edition_id)	18	1
4.	→ Seq Scan on book_copy as book_copy (rows=18 loops=1)	18	1
5.	→ Hash (rows=7 loops=1) Buckets: 1024 Batches: 1 Memory Usage: 9 kB	7	1
6.	→ Seq Scan on edition as edition (rows=7 loops=1)	7	1
7.	→ Hash (rows=7 loops=1) Buckets: 1024 Batches: 1 Memory Usage: 9 kB	7	1
8.	→ Seq Scan on book_info as book_info (rows=7 loops=1)	7	1

Total rows: 1 of 1

Query complete 00:00:00.042

Ln 10, Col 1

Создание индекса:

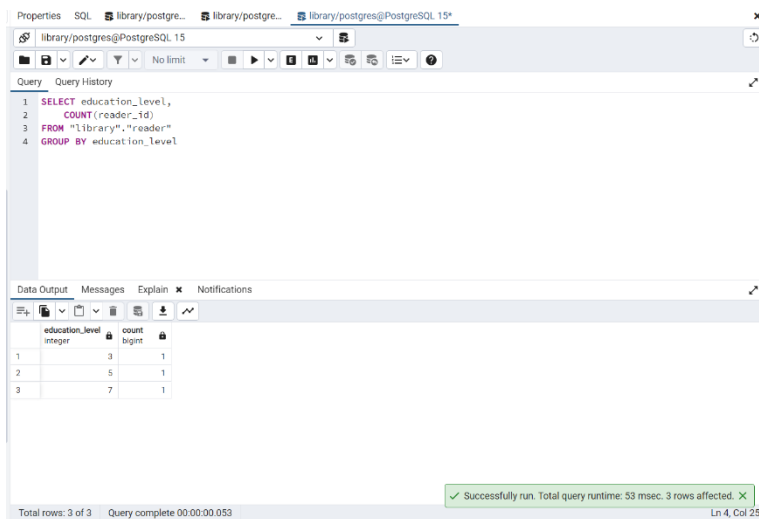
```
Query    Query History
1  CREATE INDEX "index_book_id" ON "library"."edition"(book_id)

Data Output  Messages  Explain  Notifications
CREATE INDEX

Query returned successfully in 150 msec.
```

2) Запрос с индексом 2

```
SELECT education_level,  
       COUNT(reader_id)  
  
FROM "library"."reader"  
  
GROUP BY education_level
```



Query

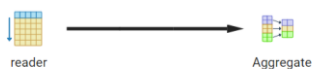
```
1 SELECT education_level,  
2     COUNT(reader_id)  
3 FROM "library"."reader"  
4 GROUP BY education_level
```

education_level	count
1	3
2	5
3	7

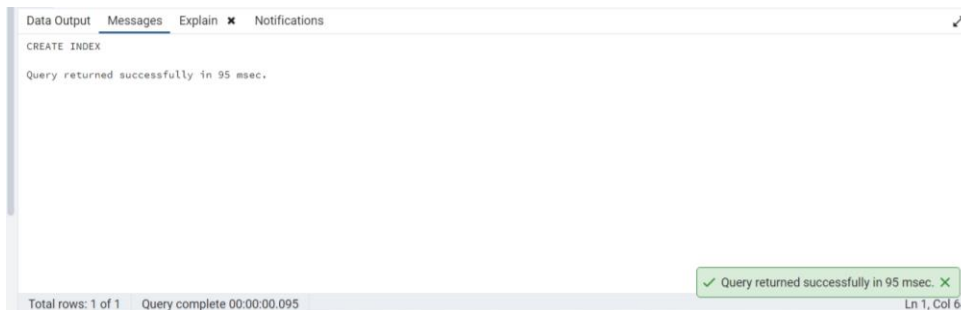
Total rows: 3 of 3 Query complete 00:00:00.053

Successfully run. Total query runtime: 53 msec. 3 rows affected.

План запроса:



Время выполнения:



CREATE INDEX

Query returned successfully in 95 msec.

Total rows: 1 of 1 Query complete 00:00:00.095

Query returned successfully in 95 msec.

Выводы:

В процессе выполнения лабораторной работы были созданы запросы для извлечения данных из базы данных PostgreSQL в соответствии с индивидуальными заданиями части 2 и 3. Также были разработаны три запроса для изменения данных (INSERT, UPDATE, DELETE), которые включали использование подзапросов. Мы также провели анализ графических представлений запросов с помощью EXPLAIN. Мы успешно выполнили все этапы, указанные в практическом задании, и приобрели опыт работы с представлениями, индексами и

выполнением запросов на изменение данных с использованием подзапросов. Особенно стоит отметить, что использование индексов в больших запросах значительно сокращает время их выполнения.

