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ФАКУЛЬТЕТ **ИУК «Информатика и управление»**

КАФЕДРА **ИУК4 «Программное обеспечение ЭВМ и информационные технологии»**

ЛАБОРАТОРНАЯ РАБОТА 7

**ДИСЦИПЛИНА: «ПРОЕКТИРОВАНИЕ СИСТЕМ ХРАНЕНИЯ И
ОБРАБОТКИ ДАННЫХ»**

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Проверил: _____ (____ Глебов С.А.____)
(Подпись) (Ф.И.О.)

Дата сдачи (защиты):

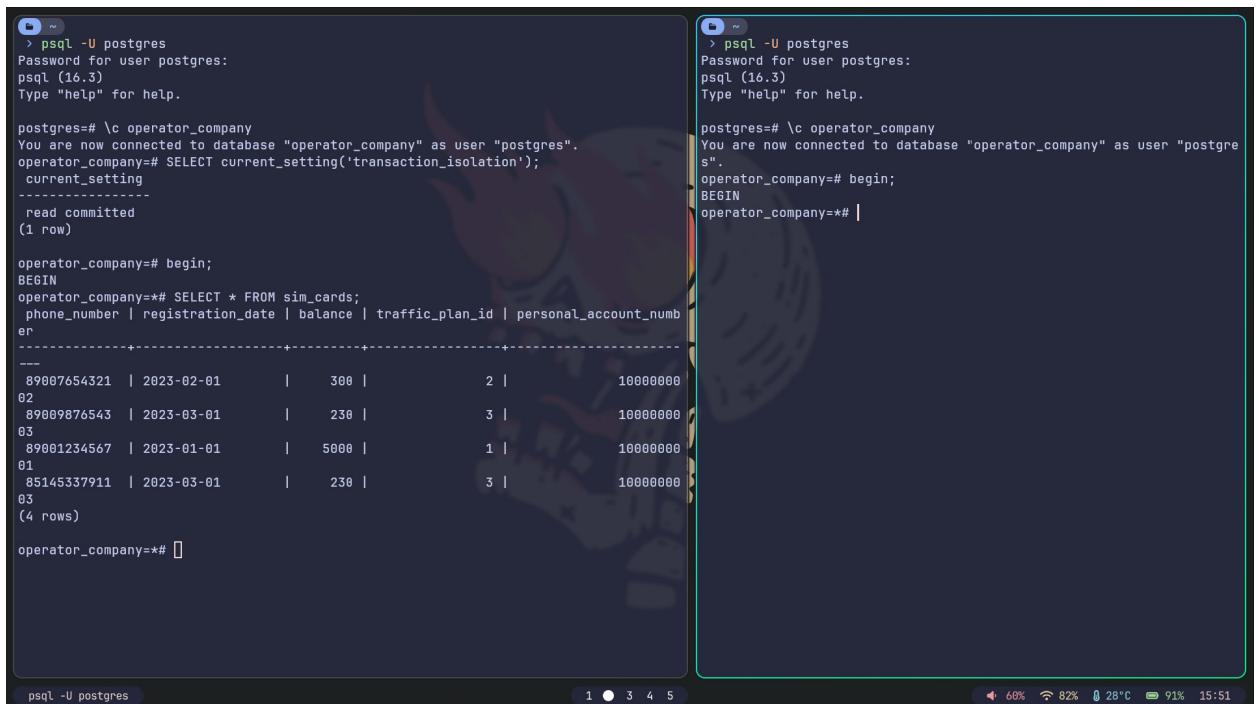
Результаты сдачи (защиты):

- Балльная оценка:

- Оценка:

Калуга , 2024

READ COMMITTED



```
> psql -U postgres
Password for user postgres:
psql (16.3)
Type "help" for help.

postgres=# \c operator_company
You are now connected to database "operator_company" as user "postgres".
operator_company=# SELECT current_setting('transaction_isolation');
current_setting
-----
read committed
(1 row)

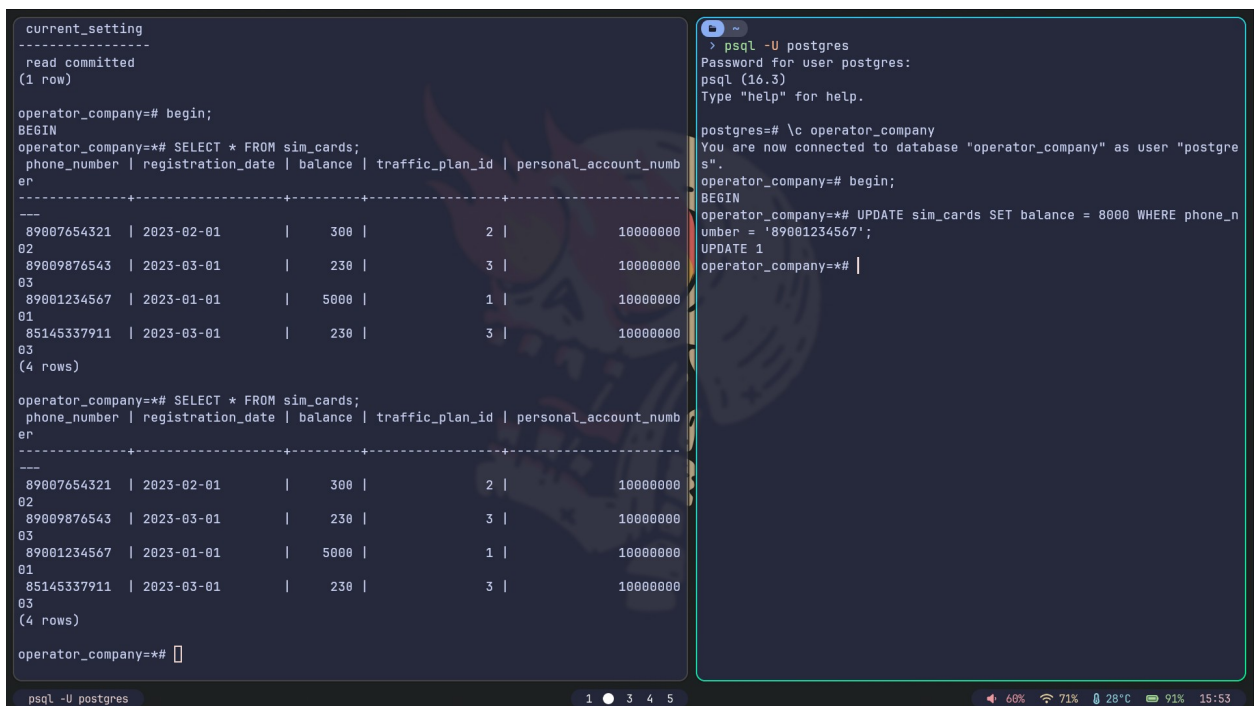
operator_company=# begin;
BEGIN
operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----+-----+-----+-----+-----
 89007654321 | 2023-02-01       | 300    | 2              | 10000000
 89009876543 | 2023-03-01       | 230    | 3              | 10000000
 89001234567 | 2023-01-01       | 5000   | 1              | 10000000
 85145337911 | 2023-03-01       | 230    | 3              | 10000000
(4 rows)

operator_company=#
```

```
> psql -U postgres
Password for user postgres:
psql (16.3)
Type "help" for help.

postgres=# \c operator_company
You are now connected to database "operator_company" as user "postgres".
operator_company=# begin;
BEGIN
operator_company=#
```

Figure 1: Просмотр в 1 транзакции до изменений во 2



```
current_setting
-----
read committed
(1 row)

operator_company=# begin;
BEGIN
operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----+-----+-----+-----+-----
 89007654321 | 2023-02-01       | 300    | 2              | 10000000
 89009876543 | 2023-03-01       | 230    | 3              | 10000000
 89001234567 | 2023-01-01       | 5000   | 1              | 10000000
 85145337911 | 2023-03-01       | 230    | 3              | 10000000
(4 rows)

operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----+-----+-----+-----+-----
 89007654321 | 2023-02-01       | 300    | 2              | 10000000
 89009876543 | 2023-03-01       | 230    | 3              | 10000000
 89001234567 | 2023-01-01       | 5000   | 1              | 10000000
 85145337911 | 2023-03-01       | 230    | 3              | 10000000
(4 rows)

operator_company=#
```

```
> psql -U postgres
Password for user postgres:
psql (16.3)
Type "help" for help.

postgres=# \c operator_company
You are now connected to database "operator_company" as user "postgres".
operator_company=# begin;
BEGIN
operator_company=# UPDATE sim_cards SET balance = 8000 WHERE phone_number = '89001234567';
UPDATE 1
operator_company=#
```

Figure 2: Изменение во 2 транзакции и просмотр в 1

```
03
89001234567 | 2023-01-01 | 5000 | 1 | 10000000
01
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
(4 rows)

operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----
89007654321 | 2023-02-01 | 300 | 2 | 10000000
02
89009876543 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 5000 | 1 | 10000000
01
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
(4 rows)

operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----
89007654321 | 2023-02-01 | 300 | 2 | 10000000
02
89009876543 | 2023-03-01 | 230 | 3 | 10000000
03
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 8500 | 1 | 10000000
01
(4 rows)

operator_company=# |
```

```
> psql -U postgres
Password for user postgres:
psql (16.3)
Type "help" for help.

postgres=# \c operator_company
You are now connected to database "operator_company" as user "postgres".
operator_company=# begin;
BEGIN
operator_company=# UPDATE sim_cards SET balance = 8000 WHERE phone_number = '89001234567';
UPDATE 1
operator_company=# COMMIT;
COMMIT
operator_company=# |
```

Figure 3: Просмотр в 1 транзакции после комита во 2

REPEATABLE READ

```
> psql -U postgres
Password for user postgres:
psql (16.3)
Type "help" for help.

postgres=# \c operator_company
You are now connected to database "operator_company" as user "postgres".
operator_company=# begin;
BEGIN
operator_company=# SET TRANSACTION ISOLATION LEVEL REPEATABLE READ;
SET
operator_company=# SELECT current_setting('transaction_isolation');
current_setting
-----
repeatable read
(1 row)

operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----
89007654321 | 2023-02-01 | 300 | 2 | 10000000
02
89009876543 | 2023-03-01 | 230 | 3 | 10000000
03
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 8500 | 1 | 10000000
01
(4 rows)

operator_company=# |
```

```
> psql -U postgres
Password for user postgres:
psql (16.3)
Type "help" for help.

postgres=# \c operator_company
You are now connected to database "operator_company" as user "postgres".
operator_company=# begin;
BEGIN
operator_company=# |
```

Figure 4: Просмотр в 1 транзакции до изменения во 2

```
SET
operator_company=# SELECT current_setting('transaction_isolation');
current_setting
-----
repeatable read
(1 row)

operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----+-----+-----+-----+-----
89007654321 | 2023-02-01 | 300 | 2 | 10000000
02
89009876543 | 2023-03-01 | 230 | 3 | 10000000
03
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 8500 | 1 | 10000000
01
(4 rows)

operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----+-----+-----+-----+-----
89007654321 | 2023-02-01 | 300 | 2 | 10000000
02
89009876543 | 2023-03-01 | 230 | 3 | 10000000
03
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 8500 | 1 | 10000000
01
(4 rows)

operator_company=#
```

```
> psql -U postgres
Password for user postgres:
psql (16.3)
Type "help" for help.

postgres=# \c operator_company
You are now connected to database "operator_company" as user "postgres".
operator_company=# begin;
BEGIN
operator_company=# UPDATE sim_cards SET balance = 5000 WHERE phone_number = '89001234567';
UPDATE 1
operator_company=#
```

Figure 5: Изменение во 2 транзакции и просмотр в 1

```
03
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 8500 | 1 | 10000000
01
(4 rows)

operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----+-----+-----+-----+-----
89007654321 | 2023-02-01 | 300 | 2 | 10000000
02
89009876543 | 2023-03-01 | 230 | 3 | 10000000
03
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 8500 | 1 | 10000000
01
(4 rows)

operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----+-----+-----+-----+-----
89007654321 | 2023-02-01 | 300 | 2 | 10000000
02
89009876543 | 2023-03-01 | 230 | 3 | 10000000
03
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 8500 | 1 | 10000000
01
(4 rows)

operator_company=#
```

```
> psql -U postgres
Password for user postgres:
psql (16.3)
Type "help" for help.

postgres=# \c operator_company
You are now connected to database "operator_company" as user "postgres".
operator_company=# begin;
BEGIN
operator_company=# UPDATE sim_cards SET balance = 5000 WHERE phone_number = '89001234567';
UPDATE 1
operator_company=# COMMIT;
COMMIT
operator_company=#
```

Figure 6: Просмотр в 1 транзакции после комита во 2

```
01
(4 rows)

operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----
89007654321 | 2023-02-01 | 300 | 2 | 10000000
02
89009876543 | 2023-03-01 | 230 | 3 | 10000000
03
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 8500 | 1 | 10000000
01
(4 rows)

operator_company=# COMMIT;
COMMIT
operator_company=# begin;
BEGIN
operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----
89007654321 | 2023-02-01 | 300 | 2 | 10000000
02
89009876543 | 2023-03-01 | 230 | 3 | 10000000
03
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 5000 | 1 | 10000000
01
(4 rows)

operator_company=# |

postgres=# \c operator_company
You are now connected to database "operator_company" as user "postgres".
operator_company=# begin;
BEGIN
operator_company=# UPDATE sim_cards SET balance = 5000 WHERE phone_number = '89001234567';
UPDATE 1
operator_company=# COMMIT;
COMMIT
operator_company=# |
```

Figure 7: Создание новой транзакции (после 1) и просмотр

READ UNCOMMITTED

```
> psql -U postgres
Password for user postgres:
psql (16.3)
Type "help" for help.

postgres=# \c operator_company
You are now connected to database "operator_company" as user "postgres".
operator_company=# begin;
BEGIN
operator_company=# SET TRANSACTION ISOLATION LEVEL READ UNCOMMITTED;
SET
operator_company=# SELECT current_setting('transaction_isolation');
 current_setting
-----
read uncommitted
(1 row)

operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----
89007654321 | 2023-02-01 | 300 | 2 | 10000000
02
89009876543 | 2023-03-01 | 230 | 3 | 10000000
03
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 5000 | 1 | 10000000
01
(4 rows)

operator_company=# |

> psql -U postgres
Password for user postgres:
psql (16.3)
Type "help" for help.

postgres=# \c operator_company
You are now connected to database "operator_company" as user "postgres".
operator_company=# begin;
BEGIN
operator_company=# |
```

Figure 8: Просмотр в 1 транзакции до изменения во 2


```
SET
operator_company=# SELECT current_setting('transaction_isolation');
current_setting
-----
read uncommitted
(1 row)

operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----+-----+-----+-----+-----
---
89007654321 | 2023-02-01 | 300 | 2 | 10000000
02
89009876543 | 2023-03-01 | 230 | 3 | 10000000
03
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 5000 | 1 | 10000000
01
(4 rows)

operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----+-----+-----+-----+-----
---
89007654321 | 2023-02-01 | 300 | 2 | 10000000
02
89009876543 | 2023-03-01 | 230 | 3 | 10000000
03
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 5000 | 1 | 10000000
01
(4 rows)

operator_company=#
```

```
> psql -U postgres
Password for user postgres:
psql (16.3)
Type "help" for help.

postgres=# \c operator_company
You are now connected to database "operator_company" as user "postgres".
operator_company=# begin;
BEGIN
operator_company=# UPDATE sim_cards SET balance = 8300 WHERE phone_number = '89001234567';
UPDATE 1
operator_company=#
```

Figure 9: Изменение во 2 транзакции и просмотр в 1

```
03
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 5000 | 1 | 10000000
01
(4 rows)

operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----+-----+-----+-----+-----
---
89007654321 | 2023-02-01 | 300 | 2 | 10000000
02
89009876543 | 2023-03-01 | 230 | 3 | 10000000
03
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 5000 | 1 | 10000000
01
(4 rows)

operator_company=# SELECT * FROM sim_cards;
 phone_number | registration_date | balance | traffic_plan_id | personal_account_number
-----+-----+-----+-----+-----
---
89007654321 | 2023-02-01 | 300 | 2 | 10000000
02
89009876543 | 2023-03-01 | 230 | 3 | 10000000
03
85145337911 | 2023-03-01 | 230 | 3 | 10000000
03
89001234567 | 2023-01-01 | 8800 | 1 | 10000000
01
(4 rows)

operator_company=#
```

```
> psql -U postgres
Password for user postgres:
psql (16.3)
Type "help" for help.

postgres=# \c operator_company
You are now connected to database "operator_company" as user "postgres".
operator_company=# begin;
BEGIN
operator_company=# UPDATE sim_cards SET balance = 8300 WHERE phone_number = '89001234567';
UPDATE 1
operator_company=# COMMIT;
COMMIT
operator_company=#
```

Figure 10: Просмотр в 1 транзакции после комита во 2

Вывод: в ходе лабораторной работы были рассмотрены различные уровни изоляций в транзакции.