



МИНОБРНАУКИ РОССИИ

Федеральное государственное бюджетное образовательное учреждение  
высшего образования

«МИРЭА – Российский технологический университет»

**РТУ МИРЭА**

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**Институт информационных технологий (ИИТ)  
Кафедра цифровой трансформации (ЦТ)**

**ОТЧЕТ ПО ПРАКТИЧЕСКОЙ РАБОТЕ**  
по дисциплине «Разработка баз данных»

**Практическое занятие №5**

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Отчет представлен «\_\_» \_\_\_\_\_ 2025 г.

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## ПОСТАНОВКА ЗАДАЧИ

**Цель работы:** Формирование у студентов углубленных навыков работы с объектами баз данных в СУБД PostgreSQL, смещая акцент от прямого манипулирования данными к созданию переиспользуемых логических конструкций.

### Постановка задачи:

Задание 1: создание модифицируемого представления.

Задание 2: модификация данных через представление.

1. Добавить новую запись с помощью оператора INSERT.
2. Удалить существующую запись с помощью оператора DELETE.

Задание 3: создание немодифицируемого аналитического представления.

Задание 4: использование аналитического представления в запросах.

Задание 5: создание и обновление материализованного.

1. Создать материализованное представление для ускорения выполнения ресурсоемкого аналитического запроса.
2. Продемонстрировать процесс обновления данных в представлении с помощью команды REFRESH MATERIALIZED VIEW viewName.

Задание 6: разработка пользовательской функции для аналитических вычислений.

1. Разработать пользовательскую функцию, которая инкапсулирует комплексный аналитический расчет.
2. Продемонстрировать вызов функции в составе SELECT-запроса.

Задание 7: разработка хранимой процедуры для выполнения сложной операции.

Задание 8: демонстрация вызова хранимой процедуры.

## ХОД РАБОТЫ

### Начальные данные

|   | 123 id_employee | 123 id_job_position | AZ first_name | AZ second_name | AZ third_name | AZ app_account_password_hash | AZ phone_number |   |
|---|-----------------|---------------------|---------------|----------------|---------------|------------------------------|-----------------|---|
| 1 | 1               | 1                   | Alice         | Johnson        | [NULL]        | emp_hash_1                   | 555-3333        | 1 |
| 2 | 2               | 2                   | Bob           | Williams       | Lee           | emp_hash_2                   | 555-4444        | 2 |
| 3 | 3               | 3                   | Carol         | Martinez       | [NULL]        | emp_hash_3                   | 555-8888        | 3 |
| 4 | 4               | 4                   | Dave          | Anderson       | Paul          | emp_hash_4                   | 555-9999        | 4 |
| 5 | 5               | 5                   | Eva           | Garcia         | Maria         | emp_hash_5                   | 555-0000        | 5 |
| 6 | 6               | 2                   | Frank         | Taylor         | [NULL]        | emp_hash_6                   | 555-1212        | 6 |
| 7 | 7               | 3                   | Grace         | Thomas         | Elizabeth     | emp_hash_7                   | 555-1313        | 7 |

Рисунок 1 – Содержание таблицы employee

|    | 123 id_product | AZ name          | AZ description                       | 123 price |  |
|----|----------------|------------------|--------------------------------------|-----------|--|
| 1  | 1              | Margherita Pizza | Classic pizza with tomato and cheese | \$10.99   |  |
| 2  | 2              | Pepperoni Pizza  | Pizza with pepperoni slices          | \$12.99   |  |
| 3  | 3              | Cola             | Refreshing soft drink                | \$2.99    |  |
| 4  | 4              | Veggie Supreme   | Pizza with assorted vegetables       | \$14.99   |  |
| 5  | 5              | Chocolate Cake   | Rich chocolate dessert               | \$6.99    |  |
| 6  | 6              | Caesar Salad     | Fresh salad with Caesar dressing     | \$8.99    |  |
| 7  | 7              | Garlic Bread     | Toasted bread with garlic butter     | \$4.99    |  |
| 8  | 8              | Sprite           | Sprite                               | \$3.49    |  |
| 9  | 9              | Lipton tea       | A 1 liter bottle of Lipton tea       | \$4.49    |  |
| 10 | 10             | Chocolate muffin | Tasty little chocolate dessert       | \$4.99    |  |
| 11 | 11             | Chocolate donut  | A chocolate glazed donut             | \$5.49    |  |
|    |                |                  |                                      |           |  |

Рисунок 2 – Содержание таблицы product

|   | 123 id_category | AZ name   | AZ description          |  |
|---|-----------------|-----------|-------------------------|--|
| 1 | 1               | Pizza     | Various types of pizzas |  |
| 2 | 2               | Beverage  | Drinks and beverages    |  |
| 3 | 3               | Appetizer | Starters and snacks     |  |
| 4 | 4               | Dessert   | Sweet treats            |  |
| 5 | 5               | Salad     | Fresh salads            |  |
|   |                 |           |                         |  |

Рисунок 3 – Содержание таблицы category

|    | 123 id_product_ingredient | 123 id_product | 123 id_ingredient | 123 ingredient_weight |  |
|----|---------------------------|----------------|-------------------|-----------------------|--|
| 1  | 1                         | 1              | 1                 | 500                   |  |
| 2  | 2                         | 1              | 2                 | 200                   |  |
| 3  | 3                         | 1              | 3                 | 150                   |  |
| 4  | 4                         | 2              | 1                 | 500                   |  |
| 5  | 5                         | 2              | 2                 | 200                   |  |
| 6  | 6                         | 2              | 3                 | 150                   |  |
| 7  | 7                         | 2              | 4                 | 100                   |  |
| 8  | 8                         | 4              | 1                 | 500                   |  |
| 9  | 9                         | 4              | 2                 | 200                   |  |
| 10 | 10                        | 4              | 3                 | 150                   |  |
| 11 | 11                        | 4              | 5                 | 80                    |  |
| 12 | 12                        | 4              | 6                 | 70                    |  |
| 13 | 13                        | 4              | 7                 | 60                    |  |
|    |                           |                |                   |                       |  |

Рисунок 4 – Содержание таблицы product\_ingredient

|    | 123 id_product_category | 123 id_product | 123 id_category |  |
|----|-------------------------|----------------|-----------------|--|
| 1  | 1                       | 1              | 1               |  |
| 2  | 2                       | 2              | 1               |  |
| 3  | 3                       | 3              | 2               |  |
| 4  | 4                       | 4              | 1               |  |
| 5  | 5                       | 5              | 4               |  |
| 6  | 6                       | 6              | 5               |  |
| 7  | 7                       | 7              | 3               |  |
| 8  | 8                       | 8              | 2               |  |
| 9  | 9                       | 9              | 2               |  |
| 10 | 10                      | 10             | 4               |  |
| 11 | 11                      | 11             | 4               |  |

Рисунок 5 – Содержание таблицы product\_category

|   | 123 id_ingredient | A-Z name     |  |
|---|-------------------|--------------|--|
| 1 | 1                 | Flour        |  |
| 2 | 2                 | Cheese       |  |
| 3 | 3                 | Tomato Sauce |  |
| 4 | 4                 | Pepperoni    |  |
| 5 | 5                 | Mushrooms    |  |
| 6 | 6                 | Onions       |  |
| 7 | 7                 | Olives       |  |

Рисунок 6 – Содержание таблицы ingredient

|   | 123 id_pizzeria | A-Z phone_number | 123 id_address |  |
|---|-----------------|------------------|----------------|--|
| 1 | 1               | 555-0001         | 1              |  |
| 2 | 2               | 555-0002         | 2              |  |
| 3 | 3               | 555-0003         | 3              |  |
| 4 | 4               | 555-0004         | 4              |  |
| 5 | 5               | 555-0005         | 5              |  |

Рисунок 7 – Содержание таблицы pizzeria

|   | 123 id_pizzeria_storage | 123 id_pizzeria | 123 id_storage |  |
|---|-------------------------|-----------------|----------------|--|
| 1 | 1                       | 1               | 1              |  |
| 2 | 2                       | 2               | 2              |  |
| 3 | 3                       | 3               | 3              |  |
| 4 | 4                       | 4               | 4              |  |
| 5 | 5                       | 5               | 5              |  |

Рисунок 8 – Содержание таблицы pizzeria\_storage

|   | 123 id_storage_ingredient | 123 id_storage | 123 id_ingredient | 123 ingredient_weight |
|---|---------------------------|----------------|-------------------|-----------------------|
| 1 | 4                         | 2              | 4                 | 2 000                 |
| 2 | 5                         | 3              | 5                 | 1 500                 |
| 3 | 6                         | 4              | 6                 | 1 800                 |
| 4 | 7                         | 5              | 7                 | 1 200                 |
| 5 | 2                         | 1              | 2                 | 5 000                 |
| 6 | 1                         | 1              | 1                 | 10 000                |
| 7 | 3                         | 1              | 3                 | 3 000                 |

Рисунок 9 – Содержание таблицы storage\_ingredient

|   | 123 id_client | A-Z first_name | A-Z second_name | A-Z third_name | A-Z phone_number | 123 id_delivery_address | A-Z account_password_id_hash |
|---|---------------|----------------|-----------------|----------------|------------------|-------------------------|------------------------------|
| 1 | 1             | John           | Doe             | [NULL]         | 555-1111         | 1                       | hashed_password_123          |
| 2 | 2             | Jane           | Smith           | Marie          | 555-2222         | 2                       | hashed_password_456          |
| 3 | 3             | Mike           | Johnson         | Robert         | 555-3333         | 3                       | hashed_password_789          |
| 4 | 4             | Sarah          | Wilson          | [NULL]         | 555-4444         | 4                       | hashed_password_101          |
| 5 | 5             | David          | Brown           | James          | 555-5555         | 5                       | hashed_password_112          |
| 6 | 6             | Emily          | Davis           | Anne           | 555-6666         | 6                       | hashed_password_131          |
| 7 | 7             | Chris          | Miller          | Thomas         | 555-7777         | 7                       | hashed_password_415          |

Рисунок 10 – Содержание таблицы client

|   | 123 id_address | A-Z city    | A-Z street | 123 house_number | 123 floor | 123 unit_number |
|---|----------------|-------------|------------|------------------|-----------|-----------------|
| 1 | 1              | New York    | Main St    | 123              | [NULL]    | [NULL]          |
| 2 | 2              | Los Angeles | Oak Ave    | 456              | 3         | 5               |
| 3 | 3              | Chicago     | Pine Rd    | 789              | 2         | [NULL]          |
| 4 | 4              | Boston      | Maple St   | 321              | 1         | 2               |
| 5 | 5              | Seattle     | Cedar Ave  | 654              | 4         | 8               |
| 6 | 6              | Miami       | Palm Blvd  | 987              | [NULL]    | [NULL]          |
| 7 | 7              | Denver      | Elm St     | 147              | 2         | 3               |

Рисунок 11 – Содержание таблицы address

|    | 123 id_order | 123 id_client | 123 id_delivery_address | 123 order_amount | date_of_formation | 123 delivery_method_id | 123 status_id |
|----|--------------|---------------|-------------------------|------------------|-------------------|------------------------|---------------|
| 1  | 4            | 4             | 4                       | \$18.98          | 2025-09-08        | 1                      | 1             |
| 2  | 8            | 1             | 1                       | \$38.97          | 2025-11-21        | 2                      | 1             |
| 3  | 11           | 4             | 4                       | \$45.97          | 2025-06-16        | 1                      | 2             |
| 4  | 12           | 5             | 5                       | \$32.97          | 2025-06-10        | 2                      | 1             |
| 5  | 1            | 1             | 1                       | \$25.97          | 2025-11-05        | 2                      | 3             |
| 6  | 2            | 2             | 2                       | \$15.98          | 2025-02-06        | 1                      | 2             |
| 7  | 3            | 3             | 3                       | \$32.97          | 2025-09-07        | 2                      | 3             |
| 8  | 5            | 5             | 5                       | \$45.96          | 2025-02-09        | 2                      | 2             |
| 9  | 6            | 6             | 6                       | \$12.99          | 2025-06-10        | 1                      | 3             |
| 10 | 7            | 7             | 7                       | \$28.97          | 2025-09-11        | 1                      | 4             |
| 11 | 9            | 2             | 2                       | \$22.98          | 2025-02-07        | 1                      | 2             |
| 12 | 10           | 3             | 3                       | \$19.98          | 2025-11-21        | 2                      | 1             |

Рисунок 12 – Содержание таблицы \_order.

|    | 123 id_order_product | 123 id_order | 123 id_product | 123 product_count |
|----|----------------------|--------------|----------------|-------------------|
| 1  | 1                    | 1            | 1              | 2                 |
| 2  | 2                    | 1            | 3              | 1                 |
| 3  | 3                    | 2            | 2              | 1                 |
| 4  | 4                    | 3            | 4              | 2                 |
| 5  | 5                    | 3            | 3              | 2                 |
| 6  | 6                    | 4            | 6              | 1                 |
| 7  | 7                    | 4            | 7              | 2                 |
| 8  | 8                    | 5            | 5              | 3                 |
| 9  | 9                    | 5            | 3              | 3                 |
| 10 | 10                   | 6            | 2              | 1                 |
| 11 | 11                   | 7            | 1              | 1                 |
| 12 | 12                   | 7            | 4              | 1                 |
| 13 | 13                   | 7            | 3              | 2                 |
| 14 | 14                   | 8            | 2              | 2                 |
| 15 | 15                   | 8            | 3              | 2                 |
| 16 | 16                   | 9            | 4              | 1                 |
| 17 | 17                   | 9            | 7              | 3                 |
| 18 | 18                   | 10           | 6              | 2                 |
| 19 | 19                   | 10           | 8              | 1                 |
| 20 | 20                   | 11           | 1              | 3                 |
| 21 | 21                   | 11           | 3              | 1                 |
| 22 | 22                   | 12           | 5              | 2                 |
| 23 | 23                   | 12           | 9              | 2                 |
| 24 | 24                   | 12           | 11             | 1                 |

Рисунок 13 – Содержание таблицы order\_product.

## 1 Создание модифицируемого представления.

```

create or replace view chefs as
select
  e.*
from
  employee as e
where
  e.id_job_position = 2;

select * from chefs;

```

|   | 123 id_employee | 123 id_job_position | A2 first_name | A2 second_name | A2 third_name | A2 app_account_password_hash | A2 phone_number | 123 |
|---|-----------------|---------------------|---------------|----------------|---------------|------------------------------|-----------------|-----|
| 1 |                 | 2                   | Bob           | Williams       | Lee           | emp_hash_2                   | 555-4444        |     |
| 2 |                 | 6                   | Frank         | Taylor         | [NULL]        | emp_hash_6                   | 555-1212        |     |

Рисунок 14

## 2 Модификация данных через представление.

### 2.1 Добавить новую запись с помощью оператора INSERT.

```

insert into chefs (id_job_position, first_name, second_name, third_name, app_account_password_hash, phone_number,
  id_registration_address, employment_date, employment_contract_end_date)
values (2, 'John', 'Silksong', null, 'hash', '123-4567', 1, '2025-01-01', '2025-01-02');

select * from employee where first_name = 'John' and second_name = 'Silksong';

```

|   | 123 id_employee | 123 id_job_position | A2 first_name | A2 second_name | A2 third_name | A2 app_account_password_hash | A2 phone_number | 123 |
|---|-----------------|---------------------|---------------|----------------|---------------|------------------------------|-----------------|-----|
| 1 | 12              | 2                   | John          | Silksong       | [NULL]        | hash                         | 123-4567        |     |

Рисунок 15

## 2.2 Удалить существующую запись с помощью оператора DELETE.

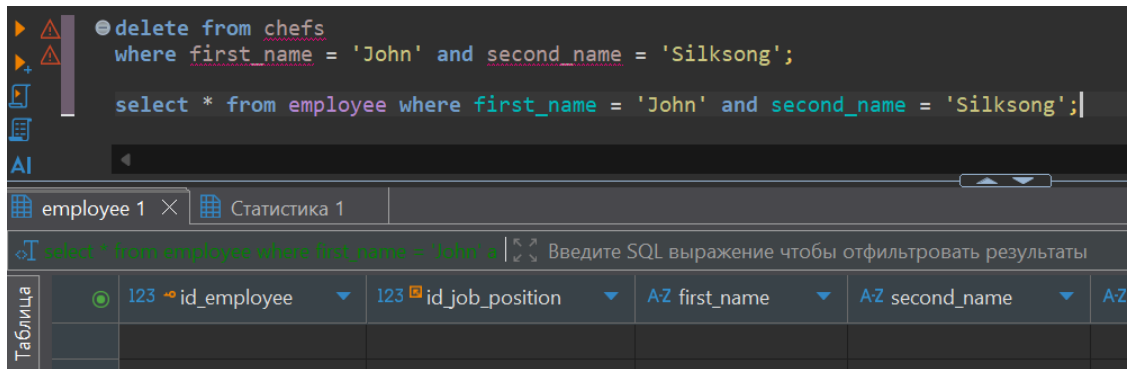


Рисунок 16

## 3 Создание немодифицируемого аналитического представления.

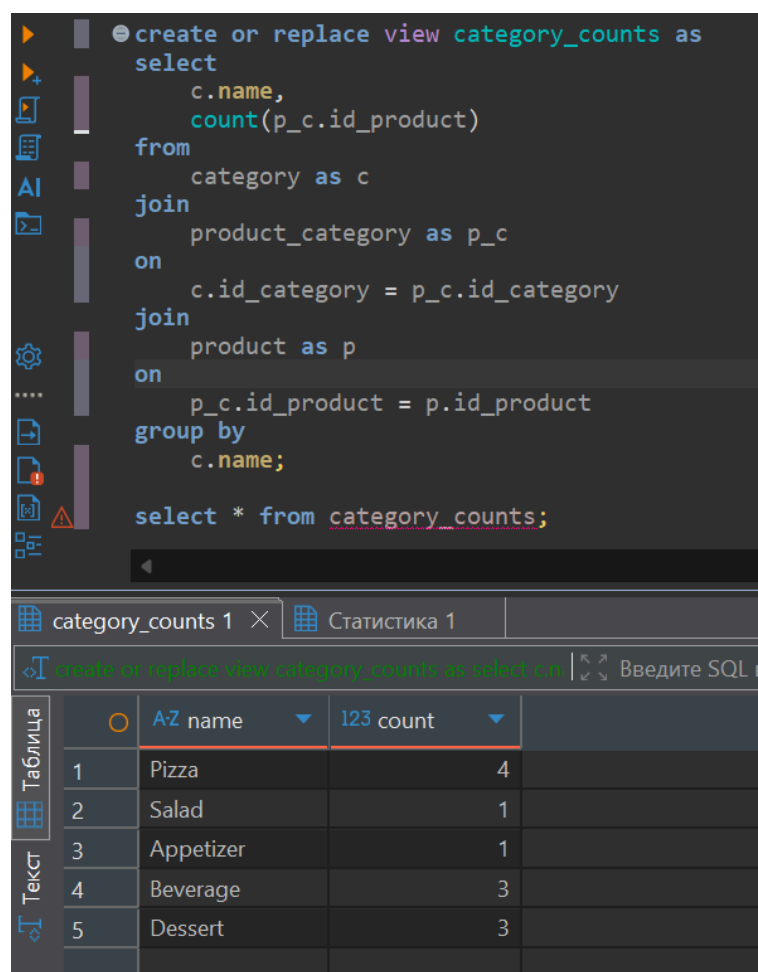


Рисунок 17

## 4 Использование аналитического представления в запросах.

```
select
  name, count
from
  category_counts as p_co
where
  p_co.name = 'Pizza'
```

category\_counts 1

```
select name, count from category_counts as p_co where p_co.name = 'Pizza'
```

|   | A-Z name | 123 count |
|---|----------|-----------|
| 1 | Pizza    | 4         |

Рисунок 18

## 5 Создание и обновление материализованного представления.

### 5.1 Создать материализованное представление.

```
create materialized view pizzas as
select
  p.*, c.name as category_name
from
  product as p
join
  product_category as p_c
on
  p.id_product = p_c.id_product
join
  category as c
on
  p_c.id_category = c.id_category
where
  c.name = 'Pizza';
select * from pizzas;
```

pizzas 1

Таблица

|   | 123 id_product | A-Z name         | A-Z description                      | 123 price | A-Z category_name |
|---|----------------|------------------|--------------------------------------|-----------|-------------------|
| 1 | 1              | Margherita Pizza | Classic pizza with tomato and cheese | \$10.99   | Pizza             |
| 2 | 2              | Pepperoni Pizza  | Pizza with pepperoni slices          | \$12.99   | Pizza             |
| 3 | 4              | Veggie Supreme   | Pizza with assorted vegetables       | \$14.99   | Pizza             |

Рисунок 19



## 5.2 Продемонстрировать процесс обновления данных в представлении.

|    | 123 id_product | A-Z name         | A-Z description                      | 123 price |
|----|----------------|------------------|--------------------------------------|-----------|
| 1  | 1              | Margherita Pizza | Classic pizza with tomato and cheese | \$10.99   |
| 2  | 2              | Pepperoni Pizza  | Pizza with pepperoni slices          | \$12.99   |
| 3  | 3              | Cola             | Refreshing soft drink                | \$2.99    |
| 4  | 4              | Veggie Supreme   | Pizza with assorted vegetables       | \$14.99   |
| 5  | 5              | Chocolate Cake   | Rich chocolate dessert               | \$6.99    |
| 6  | 6              | Caesar Salad     | Fresh salad with Caesar dressing     | \$8.99    |
| 7  | 7              | Garlic Bread     | Toasted bread with garlic butter     | \$4.99    |
| 8  | 8              | Sprite           | Sprite                               | \$3.49    |
| 9  | 9              | Lipton tea       | A 1 liter bottle of Lipton tea       | \$4.49    |
| 10 | 10             | Chocolate muffin | Tasty little chocolate dessert       | \$4.99    |
| 11 | 11             | Chocolate donut  | A chocolate glazed donut             | \$5.49    |
| 12 | 12             | Pizza base       | If you don't want any topping        | \$1.00    |

Рисунок 20 – Содержание таблицы product после добавления новой пиццы

|    | 123 id_product_category | 123 id_product | 123 id_category |
|----|-------------------------|----------------|-----------------|
| 1  | 1                       | 1              | 1               |
| 2  | 2                       | 2              | 1               |
| 3  | 3                       | 3              | 2               |
| 4  | 4                       | 4              | 1               |
| 5  | 5                       | 5              | 4               |
| 6  | 6                       | 6              | 5               |
| 7  | 7                       | 7              | 3               |
| 8  | 8                       | 8              | 2               |
| 9  | 9                       | 9              | 2               |
| 10 | 10                      | 10             | 4               |
| 11 | 11                      | 11             | 4               |
| 12 | 12                      | 12             | 1               |

Рисунок 21 – Содержание таблицы product\_category после добавления новой связи пицца-категория

select \* from pizzas;

pizzas 1 × Статистика 1

select \* from pizzas | Введите SQL выражение чтобы отфильтровать результаты

|   | 123 id_product | A-Z name         | A-Z description                      | 123 price | A-Z category_name |
|---|----------------|------------------|--------------------------------------|-----------|-------------------|
| 1 | 1              | Margherita Pizza | Classic pizza with tomato and cheese | \$10.99   | Pizza             |
| 2 | 2              | Pepperoni Pizza  | Pizza with pepperoni slices          | \$12.99   | Pizza             |
| 3 | 4              | Veggie Supreme   | Pizza with assorted vegetables       | \$14.99   | Pizza             |

Рисунок 22 – Материализованное представление до выполнения refresh

refresh materialized view pizzas;

select \* from pizzas;

pizzas 1 × Статистика 1

select \* from pizzas | Введите SQL выражение чтобы отфильтровать результаты

|   | 123 id_product | A-Z name         | A-Z description                      | 123 price | A-Z category_name |
|---|----------------|------------------|--------------------------------------|-----------|-------------------|
| 1 | 1              | Margherita Pizza | Classic pizza with tomato and cheese | \$10.99   | Pizza             |
| 2 | 2              | Pepperoni Pizza  | Pizza with pepperoni slices          | \$12.99   | Pizza             |
| 3 | 4              | Veggie Supreme   | Pizza with assorted vegetables       | \$14.99   | Pizza             |
| 4 | 12             | Pizza base       | If you don't want any topping        | \$1.00    | Pizza             |

Рисунок 23

## 6 Разработка пользовательской функции для аналитических вычислений.

### 6.1 Разработать пользовательскую функцию, которая инкапсулирует комплексный аналитический расчет.

```
create or replace function
get_category_count(p_category_name text)
returns text as $$
declare
    category_exists BOOLEAN;
    r_category_count INTEGER;
begin
    select exists(select 1 from category
    where name = p_category_name) into category_exists;

    if not category_exists then
        raise exception 'Category with name % does not exist', p_category_name;
    end if;

    select count(p_c.id_category)
    into r_category_count
    from category as c
    join product_category as p_c
    on c.id_category = p_c.id_category
    where c.name = p_category_name
    group by c.name;

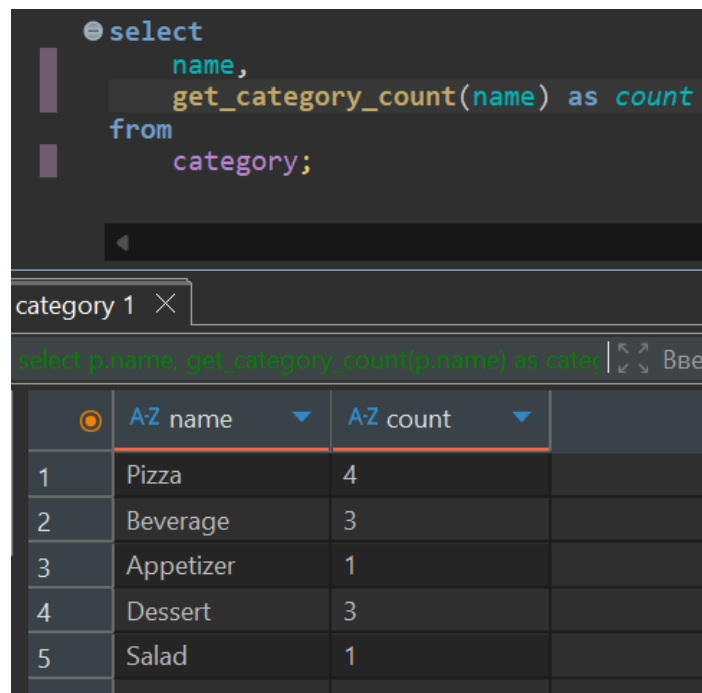
    return r_category_count;
end;
$$ language plpgsql;
```

Рисунок 24

| Статистика 1 |  |
|--------------|--|
| Name         | Value  |
| Updated Rows | 0  |
| Execute time | 0.0s   |
| Start time   | Mon Nov 03 03:05:00 MSK 2025   |
| Finish time  | Mon Nov 03 03:05:00 MSK 2025   |
| Query        | create or replace function<br>get_category_count(p_category_name text)<br>returns text as \$\$<br>declare<br>category_exists BOOLEAN;<br>r_category_count INTEGER;<br>begin<br>select exists(select 1 from category<br>where name = p_category_name) into category_exists;<br>if not category_exists then<br>raise exception 'Category with name % does not exist', p_category_name;<br>end if;<br>select count(p_c.id_category)<br>into r_category_count<br>from category as c<br>join product_category as p_c<br>on c.id_category = p_c.id_category<br>where c.name = p_category_name<br>group by c.name;<br>return r_category_count;<br>end;<br>\$\$ language plpgsql |

Рисунок 25

## 6.2 Продемонстрировать вызов функции в составе SELECT-запроса.



The screenshot shows a SQL IDE with a query editor at the top containing the following SQL code:

```
select
    name,
    get_category_count(name) as count
from
    category;
```

Below the editor, a tab labeled "category 1" is active, displaying the results of the query in a table. The table has two columns: "name" and "count". The results are as follows:

|   | AZ name   | AZ count |
|---|-----------|----------|
| 1 | Pizza     | 4        |
| 2 | Beverage  | 3        |
| 3 | Appetizer | 1        |
| 4 | Dessert   | 3        |
| 5 | Salad     | 1        |

Рисунок 26

## 7 Разработка хранимой процедуры для выполнения сложной операции.

```
create or replace procedure order_products(
    p_id_pizzeria int,
    p_id_client int,
    p_id_delivery_address int,
    p_id_product int,
    p_quantity_sold int,
    out p_success boolean,
    out p_message text
)
language plpgsql as $$
declare
    current_id_storage int;
    pizzeria_exists boolean;
    client_exists boolean;
    delivery_address_exists boolean;
    product_exists boolean;
    current_stock int;
    current_price numeric;
    total_sale_amount numeric;
    new_id_order int;
begin
```

Рисунок 27 – Процедура, часть 1

```

begin
    select exists(select 1 from pizzeria where id_pizzeria = p_id_pizzeria)
        into pizzeria_exists;
    if not pizzeria_exists then
        p_success := false;
        p_message := 'Ошибка: пиццерия с ID ' || p_id_pizzeria || ' не найдена.';
        return;
    end if;

    select exists(select 1 from client where id_client = p_id_client)
        into client_exists;
    if not client_exists then
        p_success := false;
        p_message := 'Ошибка: покупатель с ID ' || p_id_client || ' не найден.';
        return;
    end if;

    select exists(select 1 from address where id_address = p_id_delivery_address)
        into delivery_address_exists;
    if not delivery_address_exists then
        p_success := false;
        p_message := 'Ошибка: адрес с ID ' || p_id_delivery_address || ' не найден.';
        return;
    end if;

    select price::numeric
    into current_price
    from product where id_product = p_id_product for update;

    select id_storage
    into current_id_storage
    from pizzeria_storage where id_pizzeria = p_id_pizzeria;

    with max_ingredient_quantities as (
        select
            p_i.id_ingredient as id_ingredient,
            (s_i.ingredient_weight / p_i.ingredient_weight)::int as max_quantity
        from product_ingredient as p_i
        join storage_ingredient as s_i on p_i.id_ingredient = s_i.id_ingredient
        where p_i.id_product = p_id_product and s_i.id_storage = current_id_storage
    )
    select min(max_quantity)
    into current_stock
    from max_ingredient_quantities;

```

Рисунок 28 – Процедура, часть 2

```

if current_stock >= p_quantity_sold then
    with required_ingredients as (
        select id_ingredient, ingredient_weight as weight
        from product_ingredient where id_product = p_id_product
    )
    update storage_ingredient
    set ingredient_weight = ingredient_weight - r_i.weight * p_quantity_sold
    from required_ingredients as r_i
    where storage_ingredient.id_storage = current_id_storage and storage_ingredient.id_ingredient = r_i.id_ingredient;

    total_sale_amount := p_quantity_sold * current_price;

    insert into _order (id_client, id_delivery_address, order_amount, date_of_formation, delivery_method_id, status_id)
    values (p_id_client, p_id_delivery_address, total_sale_amount, CURRENT_DATE, 1, 3)
    returning id_order into new_id_order;

    insert into order_product (id_order, id_product, product_count)
    values (new_id_order, p_id_product, p_quantity_sold);

    p_success := true;
    p_message := 'Продано.';
ELSE
    p_success := FALSE;
    p_message := 'Ошибка: недостаточно товара на складе. В наличии: ' ||
current_stock || ', запрашивается: ' || p_quantity_sold;
END IF;
end;
$$;

```

Рисунок 29 – Процедура, часть 3

| Статистика 1 |   |
|--------------|---|
| Name         | Value   |
| Updated Rows | 0   |
| Execute time | 0.0s  |
| Start time   | Mon Nov 03 03:25:06 MSK 2025  |
| Finish time  | Mon Nov 03 03:25:06 MSK 2025  |
| Query        | <pre> create or replace procedure order_products(     p_id_pizzeria int,     p_id_client int,     p_id_delivery_address int,     p_id_product int,     p_quantity_sold int,     out p_success boolean,     out p_message text ) language plpgsql as \$\$ declare     current_id_storage int;     pizzeria_exists boolean;     client_exists boolean;     delivery_address_exists boolean;     product_exists boolean;     current_stock int;     current_price numeric;     total_sale_amount numeric;     new_id_order int; begin     select exists(select 1 from pizzeria where id_pizzeria = p_id_pizzeria)         into pizzeria_exists;     if not pizzeria_exists then         p_success := false;         p_message := 'Ошибка: пиццерия с ID '    p_id_pizzeria    ' не найдена.'; </pre> |

Рисунок 30

## 8 Демонстрация вызова хранимой процедуры.

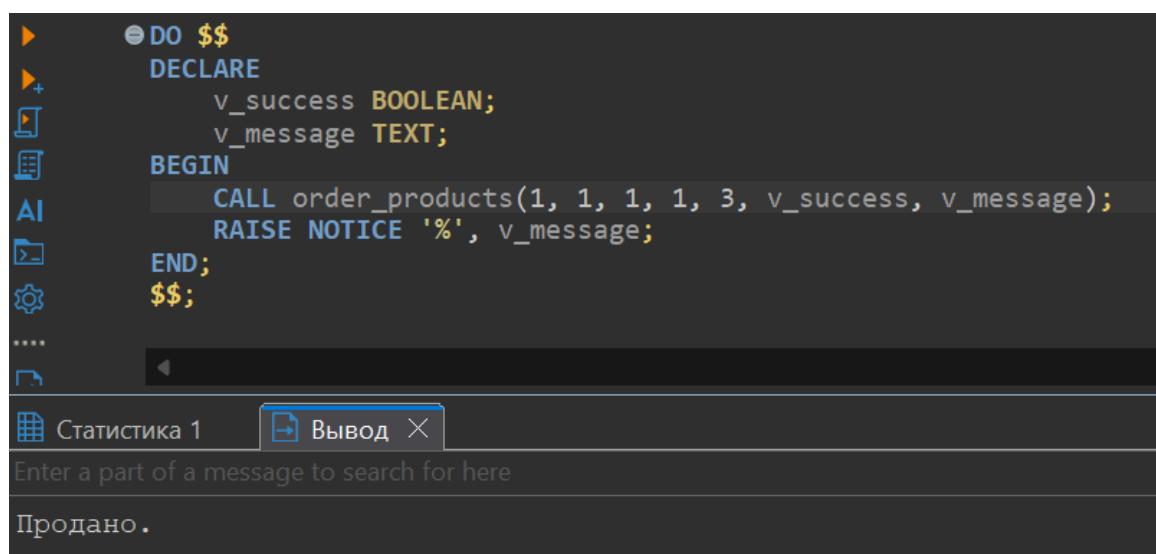


Рисунок 31 – Удачный запрос

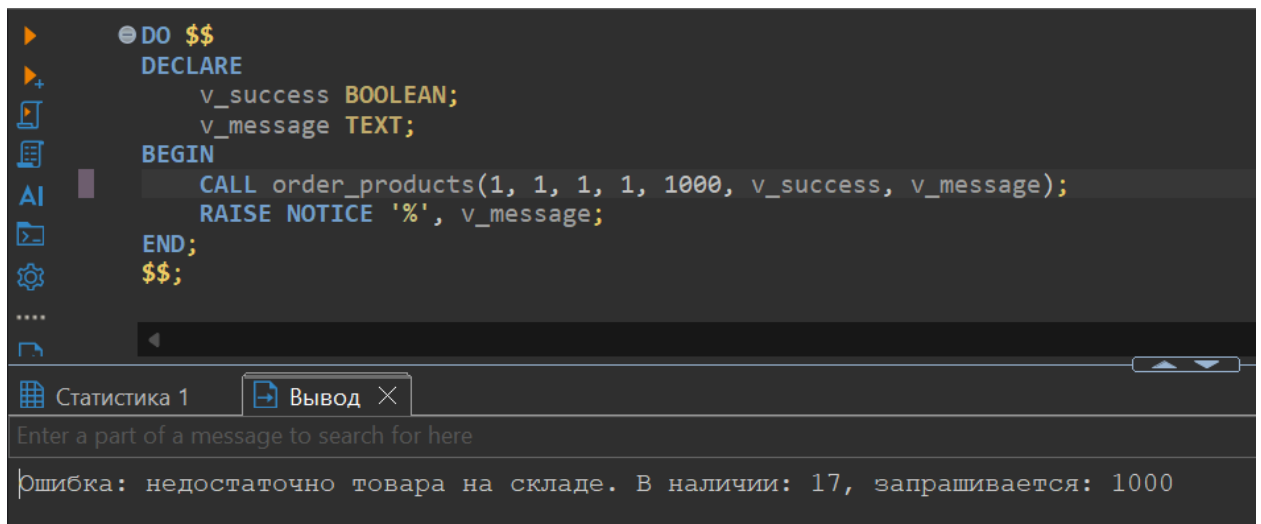


Рисунок 32 – Неудачный запрос

|    |    |   |   |         |            |   |   |
|----|----|---|---|---------|------------|---|---|
| 13 | 15 | 1 | 1 | \$32.97 | 2025-11-03 | 1 | 3 |
|----|----|---|---|---------|------------|---|---|

Рисунок 33 – Новая строка в таблице \_order

|    |    |    |   |   |
|----|----|----|---|---|
| 25 | 27 | 15 | 1 | 3 |
|----|----|----|---|---|

Рисунок 34 – Новая строка в таблице order\_product