

**МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ  
РОССИЙСКОЙ ФЕДЕРАЦИИ  
ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ АВТОНОМНОЕ  
ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ**

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«Национальный исследовательский университет ИТМО»

Факультет информационных технологий и программирования

**Лабораторная работа №2**

по предмету "Проектирование баз данных"

Вариант 1

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## 1. Инициализация схемы

SQL-скрипт:

```
CREATE EXTENSION IF NOT EXISTS "uuid-oss";

CREATE TABLE category (
    id uuid PRIMARY KEY DEFAULT uuid_generate_v4(),
    name text NOT NULL
);

CREATE TABLE product (
    id uuid PRIMARY KEY DEFAULT uuid_generate_v4(),
    name text NOT NULL UNIQUE,
    description text,
    price int NOT NULL,
    category_id uuid REFERENCES category(id) NOT NULL
);

CREATE TABLE category_parameter (
    id uuid PRIMARY KEY DEFAULT uuid_generate_v4(),
    category_id uuid REFERENCES category(id) NOT NULL,
    name text NOT NULL
);

CREATE TABLE product_parameter (
    id uuid PRIMARY KEY DEFAULT uuid_generate_v4(),
    product_id uuid REFERENCES product(id) NOT NULL,
    category_param_id uuid REFERENCES category_parameter(id) NOT NULL,
    value text NOT NULL
);

CREATE TABLE store (
    id uuid PRIMARY KEY DEFAULT uuid_generate_v4(),
    location text NOT NULL,
    name text NOT NULL
);

CREATE TABLE store_product (
    id uuid PRIMARY KEY DEFAULT uuid_generate_v4(),
    product_id uuid REFERENCES product(id) NOT NULL,
    store_id uuid REFERENCES store(id) NOT NULL,
    amount int NOT NULL
);

CREATE TABLE app_user (
    id uuid PRIMARY KEY DEFAULT uuid_generate_v4(),
    username text NOT NULL,
    password text NOT NULL,
    name text NOT NULL,
    surname text NOT NULL,
    phone_number text NOT NULL,
    verified boolean NOT NULL DEFAULT false
);
```

```

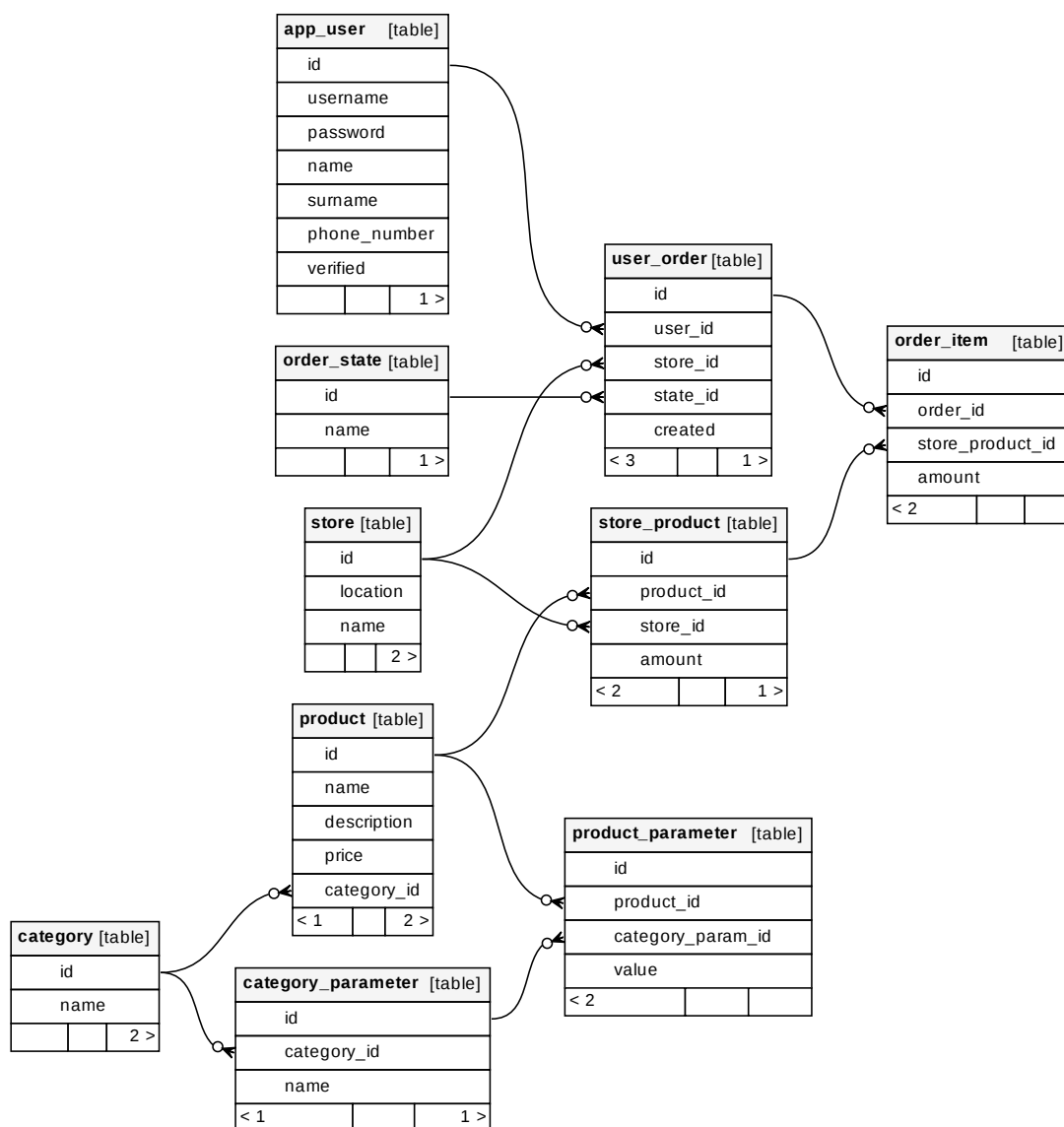
CREATE TABLE order_state (
  id uuid PRIMARY KEY DEFAULT uuid_generate_v4(),
  name text NOT NULL
);

CREATE TABLE user_order (
  id uuid PRIMARY KEY DEFAULT uuid_generate_v4(),
  user_id uuid REFERENCES app_user(id) NOT NULL,
  store_id uuid REFERENCES store(id) NOT NULL,
  state_id uuid REFERENCES order_state(id) NOT NULL
);

CREATE TABLE order_item (
  id uuid PRIMARY KEY DEFAULT uuid_generate_v4(),
  order_id uuid REFERENCES user_order(id) NOT NULL,
  store_product_id uuid REFERENCES store_product(id) NOT NULL,
  amount int NOT NULL DEFAULT 1
);

```

Сгенерированная на основе схемы данных диаграмма:



## 2. Заполнение данных

### Заполнение данных с помощью SQL:

```
INSERT INTO order_state (name)
VALUES ('COLLECTING'), ('BOOKED'), ('PAID'), ('DELIVERED');

INSERT INTO category (name)
VALUES ('Alcohol'),
       ('Fruits'),
       ('Vegetables'),
       ('Dairy'),
       ('Grocery');

INSERT INTO category_parameter (category_id, name)
VALUES ((SELECT id FROM category WHERE name = 'Alcohol'), 'ABV'),
       ((SELECT id FROM category WHERE name = 'Alcohol'), 'Country'),
       ((SELECT id FROM category WHERE name = 'Fruits'), 'Country'),
       ((SELECT id FROM category WHERE name = 'Vegetables'), 'Country'),
       ((SELECT id FROM category WHERE name = 'Dairy'), 'Fat %'),
       ((SELECT id FROM category WHERE name = 'Dairy'), 'Lactose');

INSERT INTO store (location, name)
VALUES ('St. Petersburg', 'Peter the Great delivery market'),
       ('Moscow', 'Mausoleum market'),
       ('Izmir', 'Waiting for Irish visa market');
```

### Заполнение данных с помощью CSV:

#### 1. product

```
name,description,price,category
Pinot Grigio,Italian white wine,100000,Alcohol
Bordeaux,French red wine,50000,Alcohol
Campo Viejo Rioja,Spanish red wine,120000,Alcohol
Apples,Local apples,5000,Fruits
Peaches,Local peaches,6000,Fruits
Carrot,Local carrot,4500,Vegetables
Potato,Local potato,4000,Vegetables
Yogurt,Turkish yogurt,10000,Dairy
Milk "Happy farmer",,10000,Dairy
Milk "Prostokvashino",,11000,Dairy
Spaghetti "Barilla",,15000,Grocery
```

```
psql --username=postgres --echo-all -v ON_ERROR_STOP=1 \
    -c "CREATE TEMP TABLE product_uploaded (
        name text NOT NULL UNIQUE,
        description text,
        price int NOT NULL,
        category text not null
    );" \
    -c "\copy product_uploaded FROM 'lab2/products.csv' WITH (FORMAT CSV, DELIMITER ',',
    -c "INSERT INTO product (name, description, price, category_id)
```

```
SELECT p.name, p.description, p.price, c.id
FROM product_uploaded p
JOIN category c ON p.category = c.name;"
```

```
SELECT * FROM product;
```

id	name	description	price	category_id
9d91b18d-9e3e-41c7-8879-150b09628416	Campo Viejo Rioja	Spanish red wine	120000	780ff6b2-37eb-4ee8-aaea-8b32e52afefa
60ed0820-dcaf-4608-ba51-8965b2c91bcd	Bordeaux	French red wine	50000	780ff6b2-37eb-4ee8-aaea-8b32e52afefa
0660eb5a-514b-42c0-b728-7e9221c1afc8	Pinot Grigio	Italian white wine	100000	780ff6b2-37eb-4ee8-aaea-8b32e52afefa
336f03b5-97d1-455e-88e2-b8987d7199a4	Peaches	Local peaches	6000	87734dca-aa57-4ed0-8504-a648c865fea4
8a08e8af-798c-4d68-9820-2a179ad573a5	Apples	Local apples	5000	87734dca-aa57-4ed0-8504-a648c865fea4
ef2ddcd4-9f17-4089-951e-3dcd84fdbf0b	Potato	Local potato	4000	c65d4f9a-60eb-47e6-9d41-fd03112d5f04
2d867623-1514-42ba-a93d-0856443053f8	Carrot	Local carrot	4500	c65d4f9a-60eb-47e6-9d41-fd03112d5f04
0e511590-2092-410f-b3fd-2de0c8503f19	Milk Prostokvashino		11000	4ad0efbf-1fc6-4859-9373-80c605220c49
87314036-852b-48d1-9c16-d77907c7841c	Milk Happy farmer		10000	4ad0efbf-1fc6-4859-9373-80c605220c49
585d7fbf-03c5-4511-873e-2604f05957ec	Yogurt	Turkish yogurt	10000	4ad0efbf-1fc6-4859-9373-80c605220c49
d1a46b27-c76a-40b6-8591-5ce274a31540	Spaghetti Barilla		15000	0fd32295-1986-4a4c-b061-c7391750df5f

(11 rows)

## 2. product\_parameter

```
product_name,category_param,value
Pinot Grigio,ABV,12
Pinot Grigio,Country,Italy
Bordeaux,ABV,13
Bordeaux,Country,France
Campo Viejo Rioja,ABV,13.5
Campo Viejo Rioja,Country,Spain
```

Apples, Country, Russia  
 Peaches, Country, Russia  
 Carrot, Country, Russia  
 Potato, Country, Russia  
 Yogurt, Fat %, 5  
 Yogurt, Lactose, true  
 Milk "Happy farmer", Fat %, 2.5  
 Milk "Happy farmer", Lactose, true  
 Milk "Prostokvashino", Fat %, 3  
 Milk "Prostokvashino", Lactose, true

```
psql --dbname=postgres --username=postgres --host=localhost --echo-all -v ON_ERROR_STOP=1
-c "CREATE TEMP TABLE product_param_uploaded (
    product_name text NOT NULL,
    category_param text not null,
    value text not null
);"
-c "\copy product_param_uploaded FROM 'lab2/product_params.csv' WITH (FORMAT CSV, DELIMITER ',' );"
-c "INSERT INTO product_parameter (product_id, category_param_id, value)
    SELECT p.id, cp.id, pp.value
    FROM product_param_uploaded pp
    JOIN product p ON p.name = pp.product_name
    JOIN category_parameter cp ON cp.category_id = p.category_id AND pp.category_param_id = cp.id;"
```

```
SELECT * FROM product_parameter;
```

id	product_id	category_param_id	value
da2a1d73-45b8-4b3b-90e6-86d3a9b82d06	87314036-852b-48d1-9c16-d77907c7841c	8b9580cd-87cd-4bfa-8eb0-52d545c9724e	2.5
f1468144-1afc-40a8-afcb-0f87484ca9da	585d7fbf-03c5-4511-873e-2604f05957ec	8b9580cd-87cd-4bfa-8eb0-52d545c9724e	5
c32cdd4e-9226-44cf-b71f-29c4308a4300	0e511590-2092-410f-b3fd-2de0c8503f19	8b9580cd-87cd-4bfa-8eb0-52d545c9724e	3
e18b324c-6835-499a-a4eb-f11c4968c09e	585d7fbf-03c5-4511-873e-2604f05957ec	b9edc802-648b-42cf-8249-577daeaf53e2	true
364e67a8-a7b3-4b80-bf65-bde28c67ca34	0e511590-2092-410f-b3fd-2de0c8503f19	b9edc802-648b-42cf-8249-577daeaf53e2	true
e353a50d-e197-472f-83de-2f64416a8089	87314036-852b-48d1-9c16-d77907c7841c	b9edc802-648b-42cf-8249-577daeaf53e2	true
2fb8be30-6bd7-4c2e-a5d3-958788d058e7	0660eb5a-514b-42c0-b728-7e9221c1afc8	b401d1cd-0944-49cd-ac16-3be018ca51c8	12
b4be8034-8a8c-46e9-85da-a1c2f39fa8a7	60ed0820-dcaf-4608-ba51-8965b2c91bcd	b401d1cd-0944-49cd-ac16-3be018ca51c8	13

59ffc118-4dab-4fb7-aa95-7c9e3ac88097	9d91b18d-9e3e-41c7-8879-150b09628416	b401d1cd-0944-49cd-ac16-3be018ca51c8	13.5
9da5b6e6-fd3d-42aa-abdf-89b38027874b	60ed0820-dcaf-4608-ba51-8965b2c91bcd	4de0ed4c-518a-4f03-a979-505503842960	France
0722679d-00d6-4200-8f54-53103f950eb2	9d91b18d-9e3e-41c7-8879-150b09628416	4de0ed4c-518a-4f03-a979-505503842960	Spain
9274c36f-cfb2-4693-95d1-6f21b6698ae7	0660eb5a-514b-42c0-b728-7e9221c1afc8	4de0ed4c-518a-4f03-a979-505503842960	Italy
1e2a9921-2906-4900-acfb-276ecaa46477	8a08e8af-798c-4d68-9820-2a179ad573a5	76e3b135-b7f1-48cf-8c49-5d088ba06494	Russia
1fac41e9-2829-4d80-8ce2-8c44754c8796	336f03b5-97d1-455e-88e2-b8987d7199a4	76e3b135-b7f1-48cf-8c49-5d088ba06494	Russia
50193671-3037-4358-b084-cb0f2e767ba2	ef2ddcd4-9f17-4089-951e-3dcd84fdbf0b	3374b45f-db98-4f79-a8cc-c14501f10d63	Russia
81ef0044-7559-4ded-9159-a5382ebb0217	2d867623-1514-42ba-a93d-0856443053f8	3374b45f-db98-4f79-a8cc-c14501f10d63	Russia

(16 rows)

### 3. store\_product

```
product_name,store_name,amount
Pinot Grigio,Peter the Great delivery market,2
Bordeaux,Peter the Great delivery market,3
Campo Viejo Rioja,Peter the Great delivery market,1
Apples,Peter the Great delivery market,100
Peaches,Peter the Great delivery market,50
Carrot,Peter the Great delivery market,120
Potato,Peter the Great delivery market,150
Yogurt,Peter the Great delivery market,40
Milk "Happy farmer",Peter the Great delivery market,27
Milk "Prostokvashino",Peter the Great delivery market,40
```

```
psql --dbname=postgres --username=postgres --host=localhost --echo-all -v ON_ERROR_STOP=1
-c 'CREATE TEMP TABLE store_product_uploaded (
    product_name text NOT NULL,
    store_name text NOT NULL,
    amount int NOT NULL
);'
-c "\copy store_product_uploaded FROM 'lab2/store_products.csv' WITH (FORMAT CSV, DELIMITER ',', ESCAPE '\')";
-c 'INSERT INTO store_product (product_id, store_id, amount)
SELECT p.id, s.id, sp.amount uploaded_amount
FROM store_product_uploaded sp
JOIN product p ON p.name = sp.product_name
JOIN store s ON s.name = sp.store_name
ON CONFLICT (product_id, store_id) DO UPDATE
SET amount = store_product.amount + excluded.amount'
```

```
SELECT * FROM store_product;
```

id	product_id	store_id	amount
1deda6ff-560b-4c7d-97eb-84f87990d977	0660eb5a-514b-42c0-b728-7e9221c1afc8	48525135-a801-4dc4-9a82-c0198c8d5e72	2
875d45e2-8c09-4b80-9c61-ddf6f5b7d841	60ed0820-dcaf-4608-ba51-8965b2c91bcd	48525135-a801-4dc4-9a82-c0198c8d5e72	3
fbefbacb-6854-40dc-8f15-3eb504b30515	9d91b18d-9e3e-41c7-8879-150b09628416	48525135-a801-4dc4-9a82-c0198c8d5e72	1
379d23df-9f87-475f-8a9c-38e8ad39e786	8a08e8af-798c-4d68-9820-2a179ad573a5	48525135-a801-4dc4-9a82-c0198c8d5e72	100
e8335abc-98fa-4fa3-bbf6-bebea93350f5	336f03b5-97d1-455e-88e2-b8987d7199a4	48525135-a801-4dc4-9a82-c0198c8d5e72	50
0a26bf02-5615-4b9c-813d-831028e724c3	2d867623-1514-42ba-a93d-0856443053f8	48525135-a801-4dc4-9a82-c0198c8d5e72	120
fc75f498-e05d-4a88-ac41-9ee5d5501c03	ef2ddcd4-9f17-4089-951e-3dcd84fdbf0b	48525135-a801-4dc4-9a82-c0198c8d5e72	150
62964717-f4f7-465f-85ba-a70426197854	585d7fbf-03c5-4511-873e-2604f05957ec	48525135-a801-4dc4-9a82-c0198c8d5e72	40
c28da85d-de4b-46e1-a218-2f84185199d5	87314036-852b-48d1-9c16-d77907c7841c	48525135-a801-4dc4-9a82-c0198c8d5e72	27
b35c75c9-4456-404a-9c59-3e94f39f7c5e	0e511590-2092-410f-b3fd-2de0c8503f19	48525135-a801-4dc4-9a82-c0198c8d5e72	40

(10 rows)