

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

«Национальный исследовательский университет ИТМО»

Факультет информационных технологий и программирования

Лабораторная работа №2

по предмету "Проектирование баз данных"

Вариант 1

Выполнил студент группы М34051

Кузнецов Илья

Преподаватель Демина Л.С.

Санкт-Петербург

2022

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
);
```

```

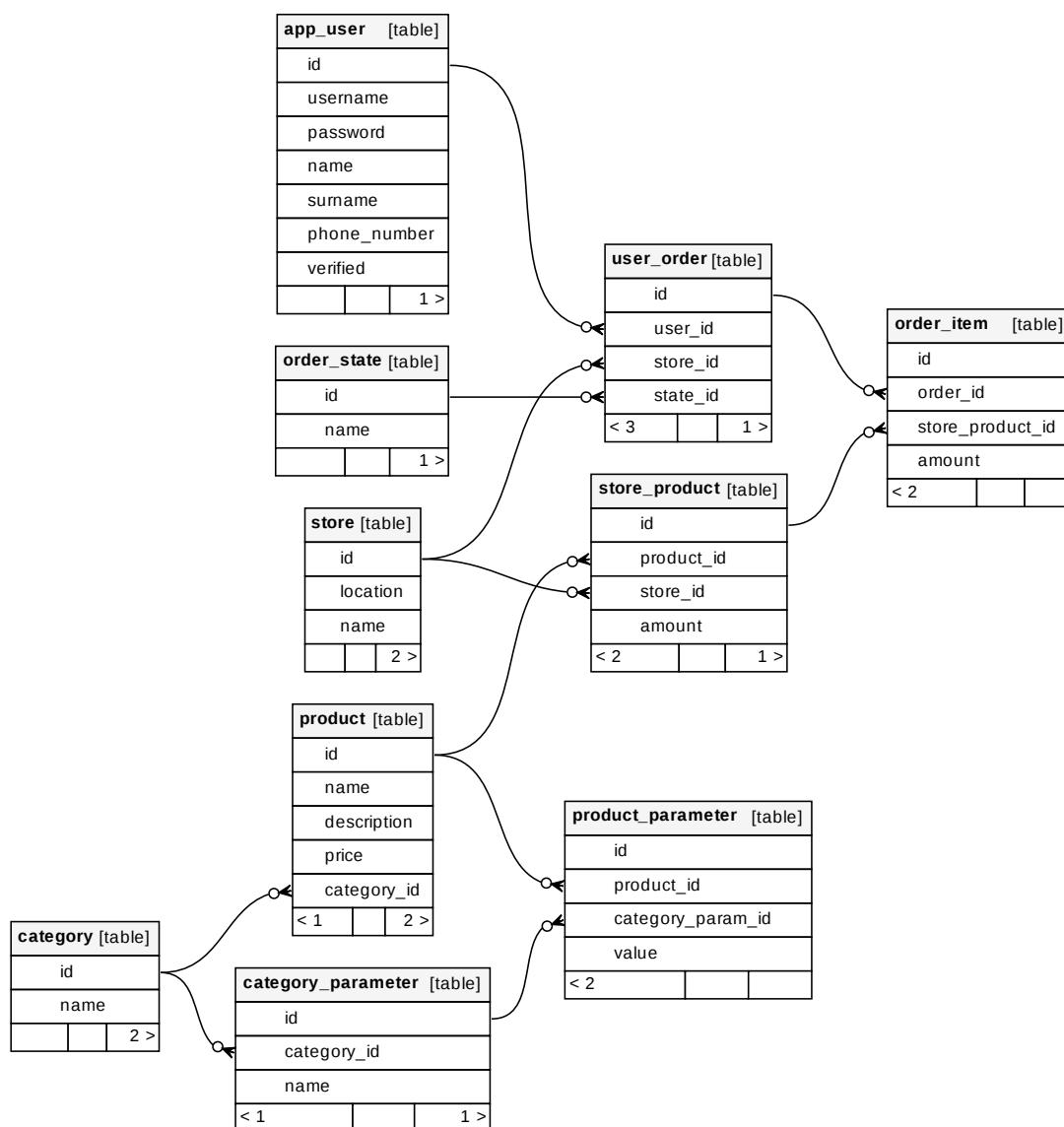
CREATE TABLE order_state (
  id uuid PRIMARY KEY DEFAULT uuid_generate_v4(),
  name text NOT NULL
);

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
55faac0f-3df4-41da-acf4-63730da54642	Campo Viejo Rioja	Spanish red wine	120000	e4c4b1f3-9a17-4290-a086-f987ebf7de3e
7aaf1b9d-1a68-45d5-9b44-1be45d23ce84	Bordeaux	French red wine	50000	e4c4b1f3-9a17-4290-a086-f987ebf7de3e
49d4507f-6449-40f0-bb5b-d8959f59831f	Pinot Grigio	Italian white wine	100000	e4c4b1f3-9a17-4290-a086-f987ebf7de3e
2e4d7cb4-6a32-4d84-8fb5-d023c4c3b8a8	Peaches	Local peaches	6000	baf09838-a769-455e-b299-ffcb2651fc55
0f2d32ce-e1cd-4fb7-b507-6e5ac060ff04	Apples	Local apples	5000	baf09838-a769-455e-b299-ffcb2651fc55
35d2f35d-f90b-4c7b-a966-a7f93b04e552	Potato	Local potato	4000	6be96173-e776-4c8a-9239-2e111a22834c
99e19a30-84e9-4d43-998c-78f3a6b5b4ad	Carrot	Local carrot	4500	6be96173-e776-4c8a-9239-2e111a22834c
7fb6b6e6-4c8c-4ff9-bccea88eb9a44ca	Milk Prostokvashino		11000	ecee40c2-896b-414d-9462-23c816973cff
7f1d619a-d9ab-4066-b1d3-0eea214b9828	Milk Happy farmer		10000	ecee40c2-896b-414d-9462-23c816973cff
182d2f52-c607-489e-87d7-dbab2c9f1e93	Yogurt	Turkish yogurt	10000	ecee40c2-896b-414d-9462-23c816973cff
a26aeec0-7d49-4563-9c98-471137979089	Spaghetti Barilla		15000	8fc1fd8d-e799-4802-b301-c617f931b422

(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
e367450a-dd38-4921-938e-5346a774e24b	35d2f35d-f90b-4c7b-a966-a7f93b04e552	a739288c-07cf-49a5-8037-c2774fb1428a	Russia
e0a7030f-b682-4f30-85c5-33c0f637e8b2	99e19a30-84e9-4d43-998c-78f3a6b5b4ad	a739288c-07cf-49a5-8037-c2774fb1428a	Russia
cae5bb20-b4a3-4076-b4e0-db909f66a4a6	2e4d7cb4-6a32-4d84-8fb5-d023c4c3b8a8	b1f35326-3026-40cc-98dc-1c308fb32ae6	Russia
3206c299-01bb-48d5-8ac8-25b2f2096663	0f2d32ce-e1cd-4fb7-b507-6e5ac060ff04	b1f35326-3026-40cc-98dc-1c308fb32ae6	Russia
df764eac-51a2-4b3d-abe4-5b2f81fba889	49d4507f-6449-40f0-bb5b-d8959f59831f	f15b60c0-d4f5-48ef-89e2-b77c61eeae53	12
9f6ce213-ce1f-48e2-ab19-47c9c69178df	7aaf1b9d-1a68-45d5-9b44-1be45d23ce84	f15b60c0-d4f5-48ef-89e2-b77c61eeae53	13
ce4484a8-1874-4fde-a251-ad1303638f49	55faac0f-3df4-41da-acf4-63730da54642	f15b60c0-d4f5-48ef-89e2-b77c61eeae53	13.5
6e8c149a-1516-4d2d-9f7a-8aa2344b67aa	49d4507f-6449-40f0-bb5b-d8959f59831f	a0c60cdf-5449-476f-8b63-b1e188aaf652	Italy

0f66b7b0-c6e3-4ecc-834d-2e0dc9bfc4f8	55faac0f-3df4-41da-acf4-63730da54642	a0c60cdf-5449-476f-8b63-b1e188aaf652	Spain
4e8deca6-b9c0-4981-9ef9-24c6bc020e8b	7aaf1b9d-1a68-45d5-9b44-1be45d23ce84	a0c60cdf-5449-476f-8b63-b1e188aaf652	France
bd16cebc-d654-4ec5-90a3-909b472d39ad	7fb6b6e6-4c8c-4ff9-bcce-ed88eb9a44ca	e27da1fe-a1cb-40ed-8d73-92c208792b82	3
953777a0-18af-4a3f-aef0-2661d955e3e1	182d2f52-c607-489e-87d7-dbab2c9f1e93	e27da1fe-a1cb-40ed-8d73-92c208792b82	5
a89c638f-f69a-4f1c-9d5b-ade85d3952ea	7f1d619a-d9ab-4066-b1d3-0eea214b9828	e27da1fe-a1cb-40ed-8d73-92c208792b82	2.5
c511640d-efbb-4ca0-9d88-4efb52ee65cb	7fb6b6e6-4c8c-4ff9-bcce-ed88eb9a44ca	2a9f38b1-55e6-4b84-8ade-b23f724bcd26	true
581dca7f-902e-4967-af9d-827daaa84638	182d2f52-c607-489e-87d7-dbab2c9f1e93	2a9f38b1-55e6-4b84-8ade-b23f724bcd26	true
8db720b9-8f67-4722-876c-1363cd31a6e6	7f1d619a-d9ab-4066-b1d3-0eea214b9828	2a9f38b1-55e6-4b84-8ade-b23f724bcd26	true

(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
16373cd1-5310-478e-9a43-3556c35f0a94	49d4507f-6449-40f0-bb5b-d8959f59831f	94ff1f94-9a34-4e90-874a-672b3a5834a9	2
18276ac0-b90a-4e3f-9941-518ef2f3975a	7aaf1b9d-1a68-45d5-9b44-1be45d23ce84	94ff1f94-9a34-4e90-874a-672b3a5834a9	3
adf6af25-580b-41db-b8e8-0403034a9768	55faac0f-3df4-41da-acf4-63730da54642	94ff1f94-9a34-4e90-874a-672b3a5834a9	1
05c84e69-a5ee-494c-9a56-12c337143430	0f2d32ce-e1cd-4fb7-b507-6e5ac060ff04	94ff1f94-9a34-4e90-874a-672b3a5834a9	100
10f8cf72-9b21-450e-a5e0-46e11189a83e	2e4d7cb4-6a32-4d84-8fb5-d023c4c3b8a8	94ff1f94-9a34-4e90-874a-672b3a5834a9	50
694616cc-4197-4fca-9ffc-ef26bf89b980	99e19a30-84e9-4d43-998c-78f3a6b5b4ad	94ff1f94-9a34-4e90-874a-672b3a5834a9	120
d7c0cfce-ea27-4687-b4d8-d5e1447cd796	35d2f35d-f90b-4c7b-a966-a7f93b04e552	94ff1f94-9a34-4e90-874a-672b3a5834a9	150
57b7cb2c-4a97-4e79-8936-8c55f6fe8290	182d2f52-c607-489e-87d7-dbab2c9f1e93	94ff1f94-9a34-4e90-874a-672b3a5834a9	40
97539c94-39d0-41bf-a131-6f6a43d90c32	7f1d619a-d9ab-4066-b1d3-0eea214b9828	94ff1f94-9a34-4e90-874a-672b3a5834a9	27
b16efe4c-5568-49cf-9b2b-28826a971a93	7fb6b6e6-4c8c-4ff9-bcce-ed88eb9a44ca	94ff1f94-9a34-4e90-874a-672b3a5834a9	40

(10 rows)