

Laboratory work 2

1. Explain the difference between DDL and DML, give the following examples:

- at least 3 DDL commands;
- at least 4 DML commands.

The SQL DDL provides commands for defining relation schemas, deleting relations, and modifying relation schemas.

The SQL DML provides the ability to query information from the database and to insert tuples into, delete tuples from, and modify tuples in the database.

```
a. CREATE TABLE classroom(
    building varchar (15),
    room varchar (7),
    capacity numeric (4, 0)
);

DROP TABLE classroom;

ALTER TABLE classroom DROP capacity;

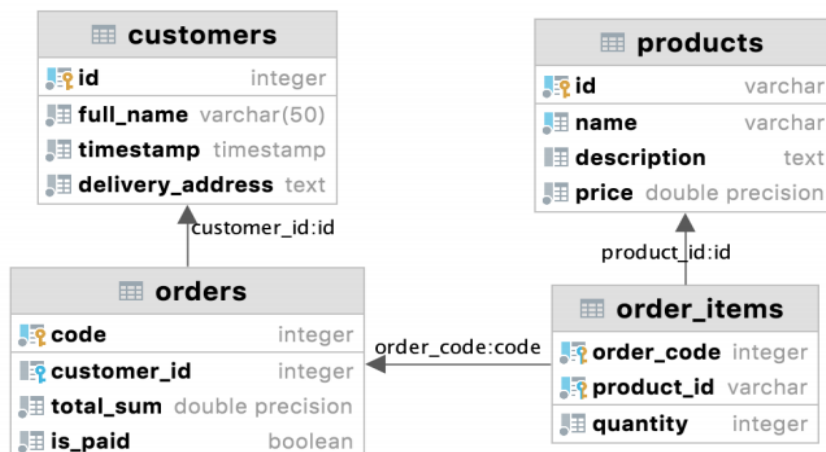
b. INSERT INTO classroom (building, room_number, capacity)
VALUES ('KBTU', '204', 20);

SELECT * FROM classroom;

DELETE FROM classroom
WHERE capacity < 10;

UPDATE classroom
SET capacity = 0
WHERE capacity < 10;
```

2. Write SQL statements to create tables in the figure below:



```

CREATE TABLE customers(
    id integer PRIMARY KEY,
    full_name varchar (50) NOT NULL,
    timestamp timestamp NOT NULL,
    delivery_address text NOT NULL
);
CREATE TABLE orders(
    code integer PRIMARY KEY,
    customer_id integer REFERENCES customers,
    total_sum double precision NOT NULL CHECK (total_sum > 0),
    is_paid boolean NOT NULL
);
CREATE TABLE products(
    id varchar PRIMARY KEY,
    name varchar NOT NULL UNIQUE,
    description text,
    price double precision NOT NULL CHECK (price > 0)
);
CREATE TABLE order_items(
    order_code integer REFERENCES orders,
    product_id varchar NOT NULL UNIQUE REFERENCES products,
    quantity integer NOT NULL CHECK (quantity > 0),
    PRIMARY KEY (order_code, product_id)
);

```

3. Write SQL statements describing tables with appropriate ***data types*** and ***constraints*** satisfying the following conditions(*maybe you need additional tables to store data **atomically** and **efficiently***):

- a. a students table storing data such as full name, age, birth date, gender, average grade, information about yourself, the need for a dormitory, additional info.
- b. an instructors table storing data such as full name, speaking languages, work experience, the possibility of having remote lessons.
- c. a lesson participants table storing data such as lesson title, teaching instructor, studying students, room number.

```

CREATE TABLE students(
    full_name varchar NOT NULL,
    age integer NOT NULL,
    birth_date date NOT NULL,
    gender varchar(6) NOT NULL,
    average_grade integer NOT NULL,
    information_about_yourself text NOT NULL,
    dormitory boolean NOT NULL,
    add_info text
);
CREATE TABLE instructors(
    full_name varchar NOT NULL,
    languages varchar NOT NULL,
    work_exp integer NOT NULL,
    remote_les boolean NOT NULL
);
CREATE TABLE lesson_participants(
    title varchar NOT NULL,
    instructor varchar NOT NULL,
    students text NOT NULL,
    room_number integer NOT NULL
);

```

4. Give examples of insertion, update and deletion of data on tables from exercise 2

```

INSERT INTO customers (Id, full_name, timestamp, delivery_address)
VALUES (1, 'Aleksandr', '2018-04-25 10:29:01.45', 'Almaty');

```

```

UPDATE products
SET description = NULL
WHERE price < 10;

```

```

DELETE FROM order_items
WHERE quantity < 10;

```