



МИНОБРНАУКИ РОССИИ

Федеральное государственное бюджетное образовательное учреждение
высшего образования

«МИРЭА – Российский технологический университет»

РТУ МИРЭА

Институт информационных технологий (ИИТ)
Кафедра практической и прикладной информатики (ППИ)

ОТЧЕТ ПО ПРАКТИЧЕСКОЙ РАБОТЕ
по дисциплине «Разработка баз данных»

Промежуточная проверка

Студент группы *ИКБО-20-19, Сибгатулов М.Д.*

(подпись)

Преподаватель *Володина А.М.*

(подпись)

Отчет представлен «__» октября 2021г.

Москва 2021 г.

Введение

В качестве темы для создания базы данных было выбрано «Кузнечное дело». В процессе работы данная тема приняла направленность базы данных для кузнечной мастерской для упрощения работы. В виду этого была создана модель, ориентированная на полноценный онлайн магазин кузнечных изделий. В ней были описаны основные элементы, которые должны быть задействованы в подобном предприятии.

Логическая модель базы данных по теме «Кузнечное дело»

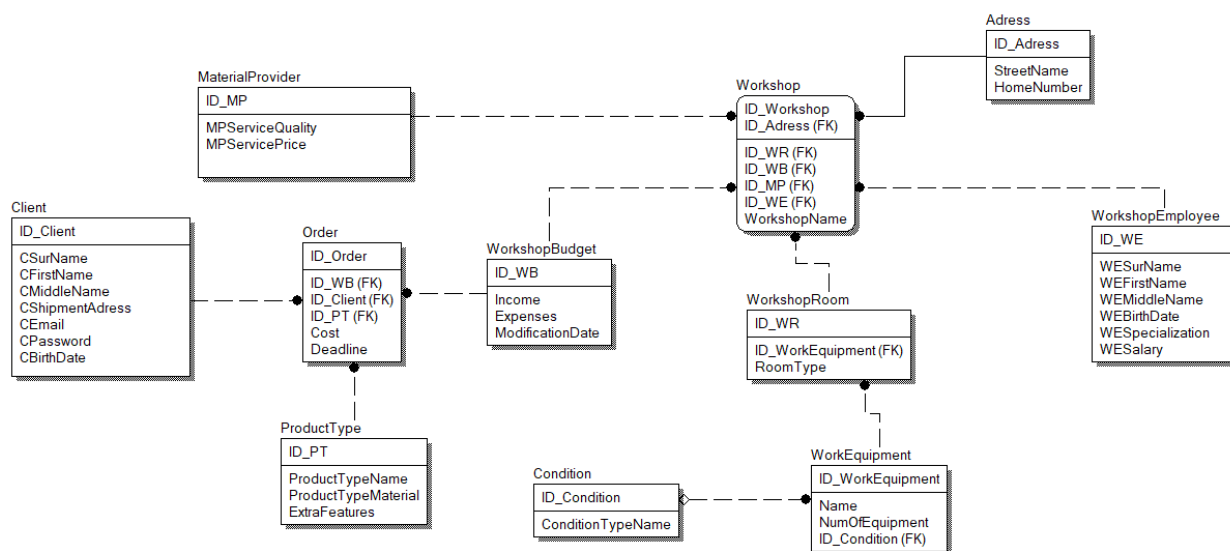


Рис. 1 – Логическая модель данных на тему «Кузнечное дело»

Описание

В данной модели можно увидеть модель базы данных Blacksmith, которая состоит из таблиц:

Client – содержит основные данные о клиенте, оформляющем заказ

MaterialProvider – содержит информацию о поставщиках

ProductType – содержит информацию об основных характеристиках заказа

Address – содержит адреса различных филиалов мастерской

WorkshopEmployee – содержит информацию о работниках мастерской

Condition – хранит информацию о состоянии инструментария

WorkEquipment – содержит информацию об инструментарии

WorkshopRoom – характеризует рабочие области(помещения)

Order – содержит информацию о заказах

WorkshopBudget – используется для учёта бюджета

Workshop – является сборником основной информации о мастерской в целом

Физическая модель базы данных по теме «Кузнечное дело»

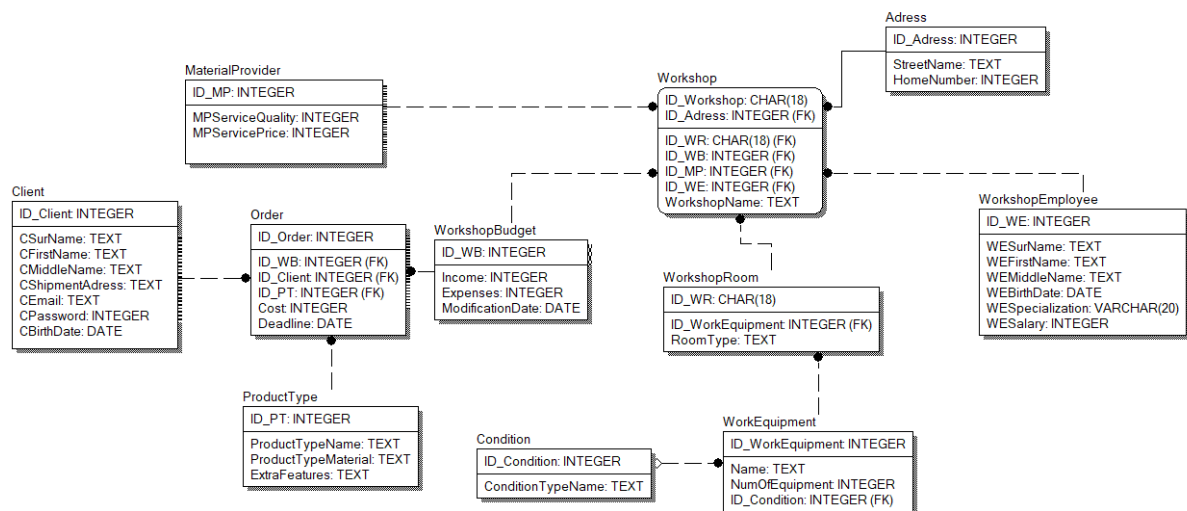
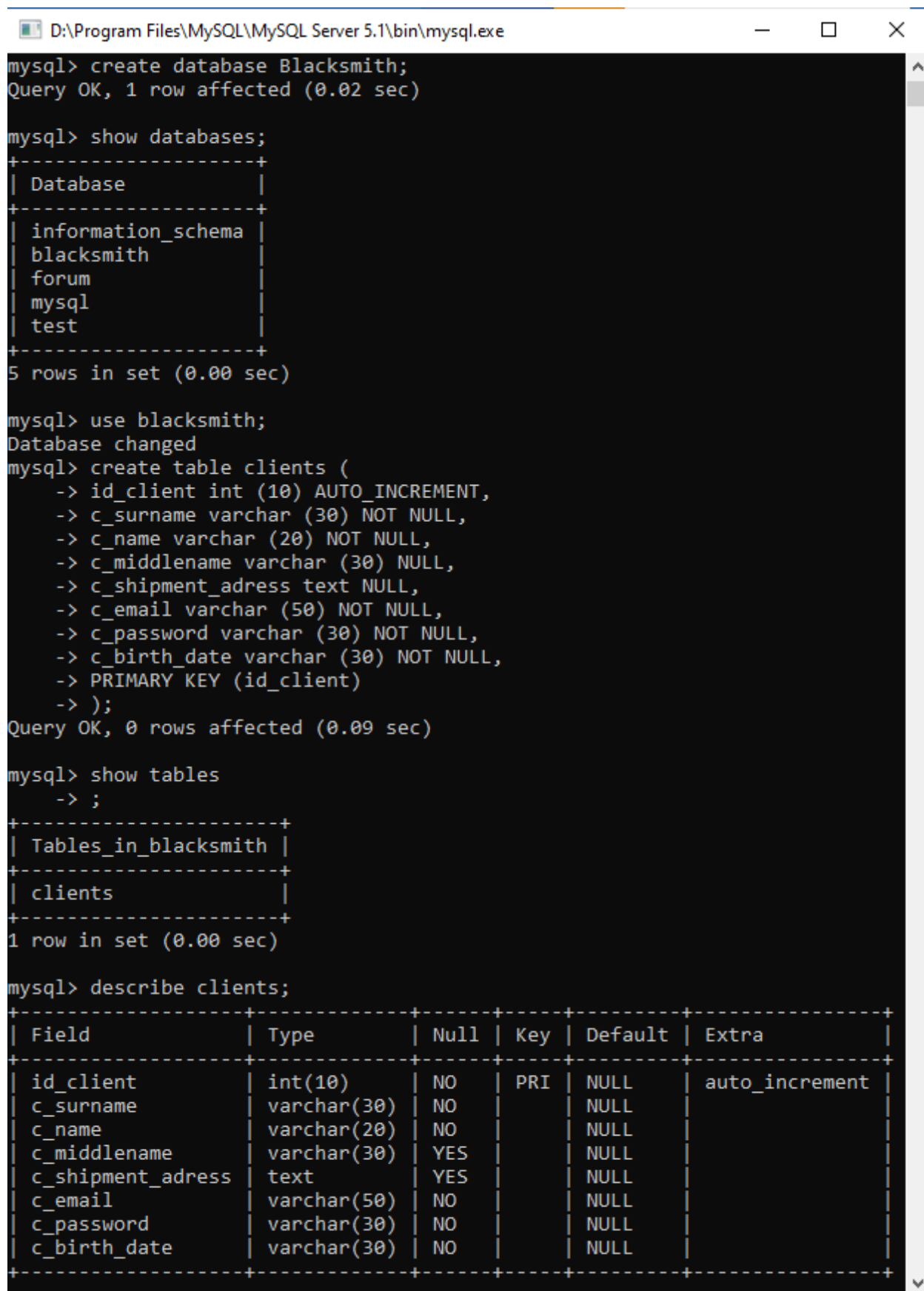


Рис. 2 – Физическая модель данных на тему «Кузнечное дело»

Создание своей базы данных в MySQL CommandLine



```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> create database Blacksmith;
Query OK, 1 row affected (0.02 sec)

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| blacksmith |
| forum |
| mysql |
| test |
+-----+
5 rows in set (0.00 sec)

mysql> use blacksmith;
Database changed
mysql> create table clients (
  -> id_client int (10) AUTO_INCREMENT,
  -> c_surname varchar (30) NOT NULL,
  -> c_name varchar (20) NOT NULL,
  -> c_middlename varchar (30) NULL,
  -> c_shipment_adress text NULL,
  -> c_email varchar (50) NOT NULL,
  -> c_password varchar (30) NOT NULL,
  -> c_birth_date varchar (30) NOT NULL,
  -> PRIMARY KEY (id_client)
  -> );
Query OK, 0 rows affected (0.09 sec)

mysql> show tables
  -> ;
+-----+
| Tables_in_blacksmith |
+-----+
| clients |
+-----+
1 row in set (0.00 sec)

mysql> describe clients;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| id_client | int(10) | NO | PRI | NULL | auto_increment |
| c_surname | varchar(30) | NO | | NULL | |
| c_name | varchar(20) | NO | | NULL | |
| c_middlename | varchar(30) | YES | | NULL | |
| c_shipment_adress | text | YES | | NULL | |
| c_email | varchar(50) | NO | | NULL | |
| c_password | varchar(30) | NO | | NULL | |
| c_birth_date | varchar(30) | NO | | NULL | |
+-----+-----+-----+-----+-----+-----+
```

Рис. 3 Создание БД Blacksmith, таблицы clients и проверка

```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> create table product_types (
  -> id_product_type int (10) AUTO_INCREMENT,
  -> pt_name text NOT NULL,
  -> pt_material text NOT NULL,
  -> pt_extra_features text NULL,
  -> PRIMARY KEY (id_product_type)
  -> );
Query OK, 0 rows affected (0.08 sec)

mysql> show tables
  -> ;
+-----+
| Tables_in_blacksmith |
+-----+
| clients               |
| product_types         |
+-----+
2 rows in set (0.00 sec)

mysql> describe product_types
  -> ;
+-----+-----+-----+-----+-----+-----+
| Field                | Type   | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| id_product_type      | int(10) | NO   | PRI | NULL    | auto_increment |
| pt_name              | text    | NO   |     | NULL    |                |
| pt_material          | text    | NO   |     | NULL    |                |
| pt_extra_features    | text    | YES  |     | NULL    |                |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.01 sec)
```

Рис. 4 Создание таблицы product_types и проверка

```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> create table material_providers (
  -> id_material_provider int (10) AUTO_INCREMENT,
  -> mp_service_quality text NOT NULL,
  -> mp_service_price varchar (30) NOT NULL,
  -> PRIMARY KEY (id_material_provider)
  -> );
Query OK, 0 rows affected (0.07 sec)

mysql> show tables
  -> ;
+-----+
| Tables_in_blacksmith |
+-----+
| clients               |
| material_providers    |
| product_types         |
+-----+
3 rows in set (0.00 sec)

mysql> describe material_providers
  -> ;
+-----+-----+-----+-----+-----+-----+
| Field                | Type      | Null | Key | Default | Extra      |
+-----+-----+-----+-----+-----+-----+
| id_material_provider | int(10)   | NO   | PRI | NULL    | auto_increment |
| mp_service_quality   | text      | NO   |     | NULL    |              |
| mp_service_price     | varchar(30) | NO   |     | NULL    |              |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.01 sec)
```

Рис. 5 Создание таблицы material_providers и проверка

```
Выбрать D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> create table conditions (
  -> id_condition int (10) AUTO_INCREMENT,
  -> condition_type_name text NOT NULL,
  -> PRIMARY KEY (id_condition)
  -> );
Query OK, 0 rows affected (0.09 sec)

mysql> show tables
  -> ;
+-----+
| Tables_in_blacksmith |
+-----+
| clients               |
| conditions             |
| material_providers    |
| product_types         |
+-----+
4 rows in set (0.00 sec)

mysql> describe conditions;
+-----+-----+-----+-----+-----+-----+
| Field          | Type   | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| id_condition   | int(10) | NO   | PRI | NULL    | auto_increment |
| condition_type_name | text   | NO   |     | NULL    |                |
+-----+-----+-----+-----+-----+-----+
2 rows in set (0.01 sec)
```

Рис. 6 Создание таблицы conditions и проверка

```
Выбрать D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> create table adress (
  -> id_adress int (10) AUTO_INCREMENT,
  -> street_name text NOT NULL,
  -> home_number varchar (20) NOT NULL,
  -> PRIMARY KEY (id_adress)
  -> );
Query OK, 0 rows affected (0.55 sec)

mysql> show tables
  -> ;
+-----+
| Tables_in_blacksmith |
+-----+
| adress               |
| clients              |
| conditions            |
| material_providers    |
| product_types        |
+-----+
5 rows in set (0.00 sec)

mysql> describe adress
  -> ;
+-----+-----+-----+-----+-----+-----+
| Field          | Type       | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| id_adress      | int(10)    | NO   | PRI | NULL    | auto_increment |
| street_name    | text       | NO   |     | NULL    |                |
| home_number    | varchar(20) | NO   |     | NULL    |                |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.01 sec)
```

Рис. 7 Создание таблицы adress и проверка

```
Выбрать D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe
mysql> create table workshop_budget (
  -> id_workshop_budget int (10) AUTO_INCREMENT,
  -> wb_income decimal (15,2) NOT NULL,
  -> wb_expenses decimal (15,2) NOT NULL,
  -> wb_modification_date datetime NOT NULL,
  -> PRIMARY KEY (id_workshop_budget)
  -> );
Query OK, 0 rows affected (0.61 sec)

mysql> show tables
  -> ;
+-----+
| Tables_in_blacksmith |
+-----+
| adress                |
| clients               |
| conditions            |
| material_providers    |
| product_types         |
| workshop_budget       |
+-----+
6 rows in set (0.00 sec)
```

Рис. 8 Создание таблицы workshop_budget

```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe
mysql> describe workshop_budget;
+-----+-----+-----+-----+-----+-----+
| Field                | Type          | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| id_workshop_budget   | int(10)       | NO   | PRI | NULL    | auto_increment |
| wb_income            | decimal(15,2) | NO   |     | NULL    |                |
| wb_expenses          | decimal(15,2) | NO   |     | NULL    |                |
| wb_modification_date | datetime      | NO   |     | NULL    |                |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.01 sec)
```

Рис. 9 Проверка правильности таблицы workshop_budget


```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> create table workshop_employees (
  -> id_workshop_employee int (10) AUTO_INCREMENT,
  -> we_surname varchar (30) NOT NULL,
  -> we_name varchar (20) NOT NULL,
  -> we_middle_name varchar (30) NULL,
  -> we_birth_date datetime NOT NULL,
  -> we_specialization varchar (30) NOT NULL,
  -> we_salary decimal (15,2) NOT NULL,
  -> PRIMARY KEY (id_workshop_employee)
  -> );
Query OK, 0 rows affected (0.07 sec)

mysql> show tables
  -> ;
+-----+
| Tables_in_blacksmith |
+-----+
| adress                |
| clients               |
| conditions            |
| material_providers    |
| product_types         |
| workshop_budget       |
| workshop_employees    |
+-----+
7 rows in set (0.00 sec)

mysql> describe workshop_employees
  -> ;
+-----+-----+-----+-----+-----+-----+
| Field                | Type          | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| id_workshop_employee | int(10)       | NO   | PRI | NULL    | auto_increment |
| we_surname           | varchar(30)   | NO   |     | NULL    |                |
| we_name              | varchar(20)   | NO   |     | NULL    |                |
| we_middle_name       | varchar(30)   | YES  |     | NULL    |                |
| we_birth_date        | datetime      | NO   |     | NULL    |                |
| we_specialization    | varchar(30)   | NO   |     | NULL    |                |
| we_salary            | decimal(15,2) | NO   |     | NULL    |                |
+-----+-----+-----+-----+-----+-----+
7 rows in set (0.01 sec)
```

Рис. 10 Создание таблицы workshop_employees и проверка

```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> create table orders (
  -> id_order int (10) AUTO_INCREMENT,
  -> cost decimal (15,2) NOT NULL,
  -> deadline datetime NOT NULL,
  -> id_client int (10) NOT NULL,
  -> id_product_type int (10) NOT NULL,
  -> id_workshop_budget int (10) NOT NULL,
  -> PRIMARY KEY (id_order),
  -> FOREIGN KEY (id_client) REFERENCES clients (id_client),
  -> FOREIGN KEY (id_product_type) REFERENCES product_types (id_product_type),
  -> FOREIGN KEY (id_workshop_budget) REFERENCES workshop_budget (id_workshop_
budget)
  -> );
Query OK, 0 rows affected (0.82 sec)

mysql> create table work_equipment (
  -> id_work_equipment int (10) AUTO_INCREMENT,
  -> name varchar (30) NOT NULL,
  -> num_of_equipment int (10) NULL,
  -> id_condition int (10) NOT NULL,
  -> PRIMARY KEY (id_work_equipment),
  -> FOREIGN KEY (id_condition) REFERENCES conditions (id_condition)
  -> );
Query OK, 0 rows affected (0.47 sec)

mysql> show tables
  -> ;
+-----+
| Tables_in_blacksmith |
+-----+
| adress                |
| clients               |
| conditions            |
| material_providers    |
| orders                |
| product_types         |
| work_equipment        |
| workshop_budget       |
| workshop_employees    |
+-----+
9 rows in set (0.00 sec)
```

Рис. 11 Создание таблиц orders и work_equipment

```

D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> describe orders
-> ;
+-----+-----+-----+-----+-----+-----+
| Field      | Type          | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| id_order   | int(10)       | NO   | PRI | NULL    | auto_increment |
| cost       | decimal(15,2) | NO   |     | NULL    |                |
| deadline   | datetime      | NO   |     | NULL    |                |
| id_client  | int(10)       | NO   |     | NULL    |                |
| id_product_type | int(10)      | NO   | MUL | NULL    |                |
| id_workshop_budget | int(10)     | NO   | MUL | NULL    |                |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.01 sec)

mysql> describe work_equipment;
+-----+-----+-----+-----+-----+-----+
| Field      | Type          | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| id_work_equipment | int(10)      | NO   | PRI | NULL    | auto_increment |
| name        | varchar(30)   | NO   |     | NULL    |                |
| num_of_equipment | int(10)       | YES  |     | NULL    |                |
| id_condition | int(10)       | NO   | MUL | NULL    |                |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.01 sec)

```

Рис. 12 Проверка правильности таблиц orders и work_equipment

```

D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> create table workshop_rooms (
-> id_workshop_room int(10) AUTO_INCREMENT,
-> room_type text NOT NULL,
-> id_work_equipment int(10) NOT NULL,
-> PRIMARY KEY (id_workshop_room),
-> FOREIGN KEY (id_work_equipment) REFERENCES work_equipment (id_work_equipment)
-> );
Query OK, 0 rows affected (0.07 sec)

mysql> create table workshop (
-> id_workshop int(10) AUTO_INCREMENT,
-> workshop_name text NOT NULL,
-> id_adress int(10) NOT NULL,
-> id_workshop_budget int(10) NOT NULL,
-> id_material_provider int(10) NOT NULL,
-> id_workshop_employee int(10) NOT NULL,
-> id_workshop_room int(10) NOT NULL,
-> PRIMARY KEY (id_workshop),
-> FOREIGN KEY (id_adress) REFERENCES adress (id_adress),
-> FOREIGN KEY (id_workshop_budget) REFERENCES workshop_budget (id_workshop_budget),
-> FOREIGN KEY (id_material_provider) REFERENCES material_providers (id_material_provider),
-> FOREIGN KEY (id_workshop_employee) REFERENCES workshop_employees (id_workshop_employee),
-> FOREIGN KEY (id_workshop_room) REFERENCES workshop_rooms (id_workshop_room)
-> );
Query OK, 0 rows affected (0.21 sec)

mysql> show tables
-> ;
+-----+
| Tables_in_blacksmith |
+-----+
| adress                |
| clients               |
| conditions            |
| material_providers    |
| orders                |
| product_types         |
| work_equipment        |
| workshop              |
| workshop_budget       |
| workshop_employees    |
| workshop_rooms        |
+-----+
11 rows in set (0.00 sec)

```

Рис. 13 Создание таблиц workshop_rooms и workshop

```

D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe
mysql> describe workshop_rooms;
+-----+-----+-----+-----+-----+-----+
| Field                | Type      | Null | Key | Default | Extra      |
+-----+-----+-----+-----+-----+-----+
| id_workshop_room     | int(10)   | NO   | PRI | NULL    | auto_increment |
| room_type            | text      | NO   |     | NULL    |              |
| id_work_equipment    | int(10)   | NO   | MUL | NULL    |              |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.01 sec)

mysql> describe workshop;
+-----+-----+-----+-----+-----+-----+
| Field                | Type      | Null | Key | Default | Extra      |
+-----+-----+-----+-----+-----+-----+
| id_workshop          | int(10)   | NO   | PRI | NULL    | auto_increment |
| workshop_name        | text      | NO   |     | NULL    |              |
| id_adress            | int(10)   | NO   | MUL | NULL    |              |
| id_workshop_budget   | int(10)   | NO   | MUL | NULL    |              |
| id_material_provider | int(10)   | NO   | MUL | NULL    |              |
| id_workshop_employee | int(10)   | NO   | MUL | NULL    |              |
| id_workshop_room     | int(10)   | NO   | MUL | NULL    |              |
+-----+-----+-----+-----+-----+-----+
7 rows in set (0.01 sec)

```

Рис. 14 Проверка правильности таблиц workshop_rooms и workshop

```

D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe
mysql> INSERT INTO clients (c_surname, c_name, c_middlename, c_shipment_adress, c_email, c_password, c_birth_date) VALUES
-> ('Иванов', 'Иван', 'Иванович', 'Беговая ул., д. 9, к. 2, кв. 10', 'ivanov@mail.ru', 'fasfasf14', '14 Sep 2000');
Query OK, 1 row affected (0.05 sec)

mysql> INSERT INTO clients (c_surname, c_name, c_shipment_adress, c_email, c_password, c_birth_date) VALUES
-> ('Smith', 'John', 'Some street, д. 9, к. 2, кв. 10', 'sjohn@gmail.com', 'araara', '4 Oct 2000');
Query OK, 1 row affected (0.04 sec)

mysql> INSERT INTO clients (c_surname, c_name, c_email, c_password, c_birth_date) VALUES
-> ('Elton', 'John', 'ejohn@gmail.com', 'fjodjs', '25 March 1947');
Query OK, 1 row affected (0.04 sec)

```

Рис. 15 Заполнение таблицы clients

```

D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe
mysql> SELECT * FROM clients;
+-----+-----+-----+-----+-----+-----+-----+-----+
| id_client | c_surname | c_name | c_middlename | c_shipment_adress | c_email | c_password | c_birth_date |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 1 | Иванов | Иван | Иванович | Беговая ул., д. 9, к. 2, кв. 10 | ivanov@mail.ru | fasfasf14 | 14 Sep 2000 |
| 2 | Smith | John | NULL | Some street, д. 9, к. 2, кв. 10 | sjohn@gmail.com | araara | 4 Oct 2000 |
| 3 | Elton | John | NULL | NULL | ejohn@gmail.com | fjodjs | 25 March 1947 |
+-----+-----+-----+-----+-----+-----+-----+-----+

```

Рис. 16 Вывод элементов таблицы clients

```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> INSERT INTO adress (street_name, home_number) VALUES
-> ('Masterov', '9 3/4');
Query OK, 1 row affected (0.44 sec)

mysql> describe adress;
+-----+-----+-----+-----+-----+-----+
| Field      | Type      | Null | Key | Default | Extra      |
+-----+-----+-----+-----+-----+-----+
| id_adress  | int(10)   | NO   | PRI | NULL    | auto_increment |
| street_name | text      | NO   |     | NULL    |              |
| home_number | varchar(20) | NO   |     | NULL    |              |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.01 sec)

mysql> SELECT * FROM adress;
+-----+-----+-----+
| id_adress | street_name | home_number |
+-----+-----+-----+
|          1 | Masterov    | 9 3/4       |
+-----+-----+-----+
1 row in set (0.00 sec)
```

Рис. 17 Заполнение и вывод элементов таблицы adress

```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> describe conditions;
+-----+-----+-----+-----+-----+-----+
| Field              | Type      | Null | Key | Default | Extra      |
+-----+-----+-----+-----+-----+-----+
| id_condition       | int(10)   | NO   | PRI | NULL    | auto_increment |
| condition_type_name | text      | NO   |     | NULL    |              |
+-----+-----+-----+-----+-----+-----+
2 rows in set (0.01 sec)

mysql> INSERT INTO conditions (condition_type_name) VALUES
-> ('Normal'),
-> ('Requires replacement/repair');
Query OK, 2 rows affected (0.51 sec)
Records: 2 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM conditions;
+-----+-----+
| id_condition | condition_type_name |
+-----+-----+
|          1   | Normal              |
|          2   | Requires replacement/repair |
+-----+-----+
```

Рис. 18 Заполнение и вывод элементов таблицы conditions

```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> INSERT INTO material_providers (mp_service_quality, mp_service_price)
VALUES
  -> ('Best', '20 dollars'),
  -> ('Good', '10 dollars');
Query OK, 2 rows affected (0.05 sec)
Records: 2  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM material_providers;
+-----+-----+-----+
| id_material_provider | mp_service_quality | mp_service_price |
+-----+-----+-----+
| 1 | Best | 20 dollars |
| 2 | Good | 10 dollars |
+-----+-----+-----+
2 rows in set (0.00 sec)
```

Рис. 19 Заполнение и вывод элементов таблицы material_providers

```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> INSERT INTO product_types (pt_name, pt_material, pt_extra_features) VALUES
  -> ('LongSword', 'Steel', 'Runes on blade');
Query OK, 1 row affected (0.05 sec)

mysql> INSERT INTO product_types (pt_name, pt_material) VALUES
  -> ('Ring', 'Gold');
Query OK, 1 row affected (0.05 sec)

mysql> SELECT * FROM product_types;
+-----+-----+-----+-----+
| id_product_type | pt_name | pt_material | pt_extra_features |
+-----+-----+-----+-----+
| 1 | LongSword | Steel | Runes on blade |
| 2 | Ring | Gold | NULL |
+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

Рис. 20 Заполнение и вывод элементов таблицы product_types

```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> INSERT INTO workshop_budget (wb_income, wb_expenses, wb_modification_date)
VALUES
  -> ('534.54', '134.32', NOW());
Query OK, 1 row affected (0.06 sec)

mysql> SELECT * FROM workshop_budget;
+-----+-----+-----+-----+
| id_workshop_budget | wb_income | wb_expenses | wb_modification_date |
+-----+-----+-----+-----+
| 1 | 534.54 | 134.32 | 2021-10-02 18:59:45 |
+-----+-----+-----+-----+
1 row in set (0.00 sec)
```

Рис. 21 Заполнение и вывод элементов таблицы workshop_budget

```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe
mysql> INSERT INTO orders (cost, deadline, id_client, id_product_type, id_workshop_budget) VALUES
-> ('30.85', '2021-10-20 20:00:00', '2', '1', '1');
Query OK, 1 row affected (0.05 sec)

mysql> SELECT * FROM orders;
+-----+-----+-----+-----+-----+-----+
| id_order | cost | deadline           | id_client | id_product_type | id_workshop_budget |
+-----+-----+-----+-----+-----+-----+
| 1       | 30.85 | 2021-10-20 20:00:00 | 2        | 1               | 1                 |
+-----+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)
```

Рис. 22 Заполнение и вывод элементов таблицы orders

```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe
mysql> INSERT INTO work_equipment (name, num_of_equipment, id_condition) VALUES
-> ('forge', '5', '1'),
-> ('anvil', '1', '2'),
-> ('anvil', '1', '1');
Query OK, 3 rows affected (0.05 sec)
Records: 3 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM work_equipment;
+-----+-----+-----+-----+
| id_work_equipment | name  | num_of_equipment | id_condition |
+-----+-----+-----+-----+
| 1                 | forge | 5                 | 1            |
| 2                 | anvil | 1                 | 2            |
| 3                 | anvil | 1                 | 1            |
+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

Рис. 23 Заполнение и вывод элементов таблицы work_equipment

```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe
mysql> INSERT INTO workshop_employees (we_surname, we_name, we_middle_name, we_birth_date, we_specialization, we_salary) VALUES
-> ('Ertek', 'Huseyn', 'Ibrahimovich', '2001-04-13 22:23:00', 'Jeweller', '30.5');
Query OK, 1 row affected (0.51 sec)

mysql> INSERT INTO workshop_employees (we_surname, we_name, we_birth_date, we_specialization, we_salary) VALUES
-> ('Avenichi', 'Adrianna', '1990-06-12 08:00:00', 'Master Blacksmith', '50');
Query OK, 1 row affected (0.04 sec)

mysql> SELECT * FROM workshop_employees;
+-----+-----+-----+-----+-----+-----+-----+
| id_workshop_employee | we_surname | we_name | we_middle_name | we_birth_date | we_specialization | we_salary |
+-----+-----+-----+-----+-----+-----+-----+
| 1                   | Ertek     | Huseyn | Ibrahimovich  | 2001-04-13 22:23:00 | Jeweller         | 30.50    |
| 2                   | Avenichi  | Adrianna | NULL          | 1990-06-12 08:00:00 | Master Blacksmith | 50.00    |
+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

Рис. 24 Заполнение и вывод элементов таблицы workshop_employees

```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> INSERT INTO workshop_rooms (room_type, id_work_equipment) VALUES
-> ('Smithy', '1'),
-> ('Smithy', '2'),
-> ('Jewelry workshop', '1'),
-> ('Jewelry workshop', '3');
Query OK, 4 rows affected (0.52 sec)
Records: 4 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM workshop_rooms;
+-----+-----+-----+
| id_workshop_room | room_type      | id_work_equipment |
+-----+-----+-----+
| 1                | Smithy         | 1                 |
| 2                | Smithy         | 2                 |
| 3                | Jewelry workshop | 1                 |
| 4                | Jewelry workshop | 3                 |
+-----+-----+-----+
4 rows in set (0.00 sec)
```

Рис. 25 Заполнение и вывод элементов таблицы workshop_rooms

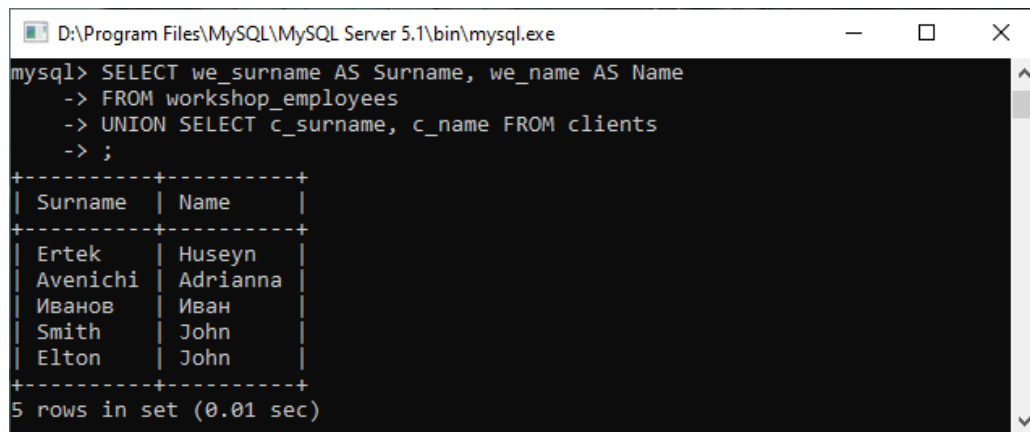
```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

mysql> INSERT INTO workshop (workshop_name, id_adress, id_workshop_budget, id_material_provider, id_workshop_employee, id_workshop_room) VALUES
-> ('Tar-Tar by Maris', '1', '1', '2', '2', '1'),
-> ('Tar-Tar by Maris', '1', '1', '1', '1', '3');
Query OK, 2 rows affected (0.51 sec)
Records: 2 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM workshop;
+-----+-----+-----+-----+-----+-----+
| id_workshop | workshop_name | id_adress | id_workshop_budget | id_material_provider | id_workshop_employee | id_workshop_room |
+-----+-----+-----+-----+-----+-----+
| 1          | Tar-Tar by Maris | 1         | 1                   | 2                   | 2                   | 1                 |
| 2          | Tar-Tar by Maris | 1         | 1                   | 1                   | 1                   | 3                 |
+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

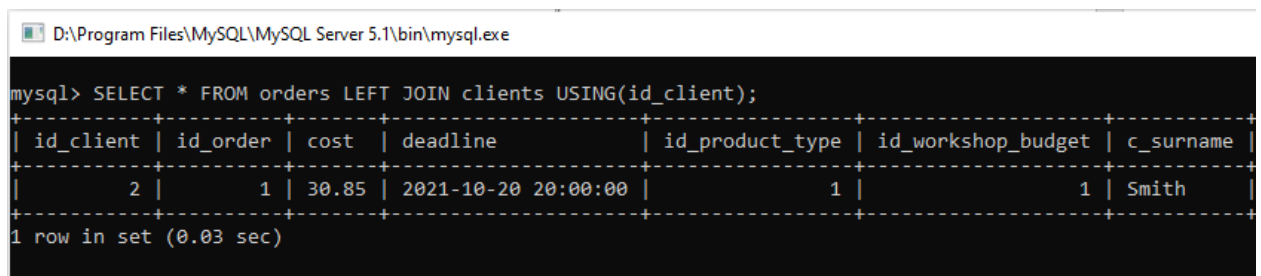
Рис. 26 Заполнение и вывод элементов таблицы workshop

Работа с запросами в базе данных Blacksmith



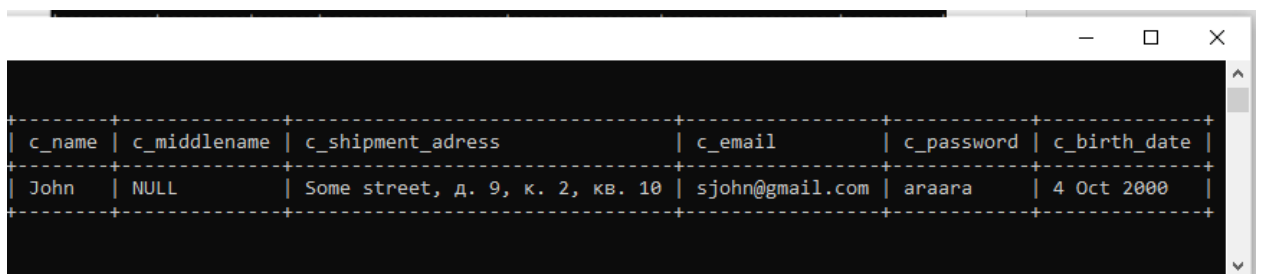
```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe
mysql> SELECT we_surname AS Surname, we_name AS Name
-> FROM workshop_employees
-> UNION SELECT c_surname, c_name FROM clients
-> ;
+-----+-----+
| Surname | Name |
+-----+-----+
| Ertek   | Huseyn |
| Avenichi | Adrianna |
| Иванов  | Иван |
| Smith   | John |
| Elton   | John |
+-----+-----+
5 rows in set (0.01 sec)
```

Рис. 27 – Объединение с использованием UNION



```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe
mysql> SELECT * FROM orders LEFT JOIN clients USING(id_client);
+-----+-----+-----+-----+-----+-----+-----+
| id_client | id_order | cost | deadline | id_product_type | id_workshop_budget | c_surname |
+-----+-----+-----+-----+-----+-----+-----+
| 2 | 1 | 30.85 | 2021-10-20 20:00:00 | 1 | 1 | Smith |
+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.03 sec)
```

Рис. 28 – Выборка с использованием LEFT JOIN часть 1



```
+-----+-----+-----+-----+-----+-----+
| c_name | c_middlename | c_shipment_adress | c_email | c_password | c_birth_date |
+-----+-----+-----+-----+-----+-----+
| John | NULL | Some street, д. 9, к. 2, кв. 10 | sjohn@gmail.com | araara | 4 Oct 2000 |
+-----+-----+-----+-----+-----+-----+
```

Рис. 29 – Выборка с использованием LEFT JOIN часть 2

```
D:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe
mysql> SELECT * FROM orders;
+-----+-----+-----+-----+-----+-----+
| id_order | cost  | deadline          | id_client | id_product_type | id_workshop_budget |
+-----+-----+-----+-----+-----+-----+
| 1        | 30.85 | 2021-10-20 20:00:00 | 2        | 1                | 1                  |
| 3        | 1000.00 | 2021-11-13 12:00:00 | 3        | 2                | 1                  |
+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)

mysql> SELECT * FROM orders WHERE deadline>="2021-10-20 20:00:00";
+-----+-----+-----+-----+-----+-----+
| id_order | cost  | deadline          | id_client | id_product_type | id_workshop_budget |
+-----+-----+-----+-----+-----+-----+
| 1        | 30.85 | 2021-10-20 20:00:00 | 2        | 1                | 1                  |
| 3        | 1000.00 | 2021-11-13 12:00:00 | 3        | 2                | 1                  |
+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)

mysql> SELECT * FROM orders WHERE deadline>"2021-10-20 20:00:00";
+-----+-----+-----+-----+-----+-----+
| id_order | cost  | deadline          | id_client | id_product_type | id_workshop_budget |
+-----+-----+-----+-----+-----+-----+
| 3        | 1000.00 | 2021-11-13 12:00:00 | 3        | 2                | 1                  |
+-----+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)
```

Рис. 30 Выборка данных по параметру deadline

Построение модели с помощью оболочки MySQL Workbench

Мною была построена модель в СУБД Workbench(Рисунок 31)

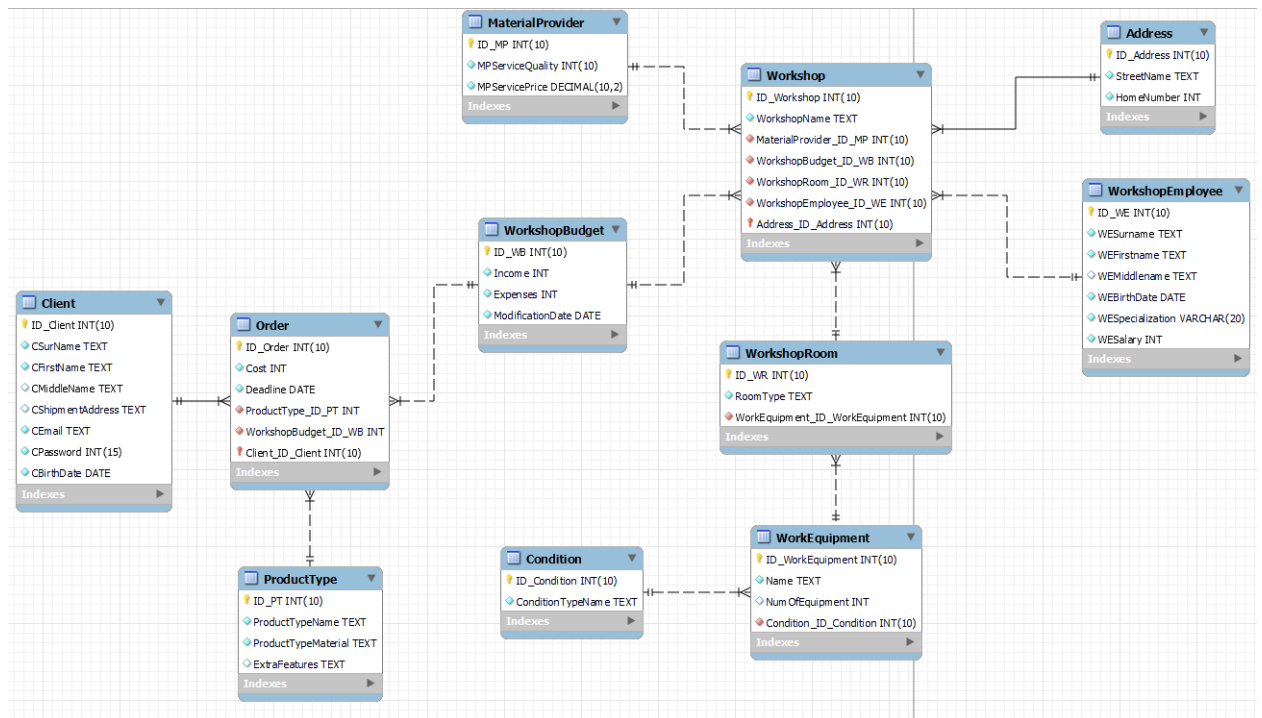


Рисунок 31 – Построенная модель

Перенос Базы Данных на другой сервер

Используя встроенные инструменты MYSQL Workbench, был получен MySql скрипт

-- MySQL Script generated by MySQL Workbench

-- Tue Nov 9 17:20:15 2021

-- Model: New Model Version: 1.0

-- MySQL Workbench Forward Engineering

```
SET @OLD_UNIQUE_CHECKS=@@UNIQUE_CHECKS, UNIQUE_CHECKS=0;
```

```
SET @OLD_FOREIGN_KEY_CHECKS=@@FOREIGN_KEY_CHECKS, FOREIGN_KEY_CHECKS=0;
```

```
SET @OLD_SQL_MODE=@@SQL_MODE, SQL_MODE='ONLY_FULL_GROUP_BY,STRICT_TRANS_TABLES,NO_ZERO_IN_DATE,NO_ZERO_DATE,ERROR_FOR_DIVISION_BY_ZERO,NO_ENGINE_SUBSTITUTION';
```

-- Schema blacksmith

-- Schema blacksmith

CREATE SCHEMA IF NOT EXISTS `blacksmith` DEFAULT CHARACTER SET utf8 ;
USE `blacksmith` ;

-- Table `blacksmith`.`Client`

CREATE TABLE IF NOT EXISTS `blacksmith`.`Client` (
 `ID_Client` INT(10) AUTO_INCREMENT,
 `CSurName` TEXT NOT NULL,
 `CFirstName` TEXT NOT NULL,
 `CMiddleName` TEXT NULL,
 `CShipmentAddress` TEXT NULL,
 `CEmail` TEXT NOT NULL,
 `CPassword` INT(15) NOT NULL,
 `CBirthDate` DATE NOT NULL,
 PRIMARY KEY (`ID_Client`))
ENGINE = InnoDB;

-- Table `blacksmith`.`MaterialProvider`

CREATE TABLE IF NOT EXISTS `blacksmith`.`MaterialProvider` (
 `ID_MP` INT(10) AUTO_INCREMENT,
 `MPServiceQuality` INT(10) NOT NULL,
 `MPServicePrice` DECIMAL(10,2) NOT NULL,

```
PRIMARY KEY (`ID_MP`))
```

```
ENGINE = InnoDB;
```

```
-- Table `blacksmith`.`ProductType`
```

```
CREATE TABLE IF NOT EXISTS `blacksmith`.`ProductType` (
```

```
  `ID_PT` INT(10) AUTO_INCREMENT,
```

```
  `ProductTypeName` TEXT NOT NULL,
```

```
  `ProductTypeMaterial` TEXT NOT NULL,
```

```
  `ExtraFeatures` TEXT NULL,
```

```
  PRIMARY KEY (`ID_PT`))
```

```
ENGINE = InnoDB;
```

```
-- Table `blacksmith`.`WorkshopBudget`
```

```
CREATE TABLE IF NOT EXISTS `blacksmith`.`WorkshopBudget` (
```

```
  `ID_WB` INT(10) AUTO_INCREMENT,
```

```
  `Income` INT NOT NULL,
```

```
  `Expenses` INT NOT NULL,
```

```
  `ModificationDate` DATE NOT NULL,
```

```
  PRIMARY KEY (`ID_WB`))
```

```
ENGINE = InnoDB;
```

```
-- Table `blacksmith`.`Order`
```

```
CREATE TABLE IF NOT EXISTS `blacksmith`.`Order` (
```

```

`ID_Order` INT(10) AUTO_INCREMENT,
`Cost` INT NOT NULL,
`Deadline` DATE NOT NULL,
`Client_ID_Client` INT NOT NULL,
`ProductType_ID_PT` INT NOT NULL,
`WorkshopBudget_ID_WB` INT NOT NULL,
PRIMARY KEY (`ID_Order, Client_ID_Client`),
INDEX `fk_Order_Client_idx` (`Client_ID_Client` ASC) VISIBLE,
INDEX `fk_Order_ProductType1_idx` (`ProductType_ID_PT` ASC) VISIBLE,
INDEX `fk_Order_WorkshopBudget1_idx` (`WorkshopBudget_ID_WB` ASC) VISIBLE,
CONSTRAINT `fk_Order_Client`
    FOREIGN KEY (`Client_ID_Client`)
    REFERENCES `blacksmith`.`Client` (`ID_Client`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
CONSTRAINT `fk_Order_ProductType1`
    FOREIGN KEY (`ProductType_ID_PT`)
    REFERENCES `blacksmith`.`ProductType` (`ID_PT`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
CONSTRAINT `fk_Order_WorkshopBudget1`
    FOREIGN KEY (`WorkshopBudget_ID_WB`)
    REFERENCES `blacksmith`.`WorkshopBudget` (`ID_WB`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;

```

```

-----
-- Table `blacksmith`.`Condition`
-----

```

```

CREATE TABLE IF NOT EXISTS `blacksmith`.`Condition` (

```

```
`ID_Condition` INT(10) AUTO_INCREMENT,  
`ConditionTypeName` TEXT NOT NULL,  
PRIMARY KEY (`ID_Condition`))  
ENGINE = InnoDB;
```

```
-- -----  
-- Table `blacksmith`.`WorkEquipment`  
-- -----
```

```
CREATE TABLE IF NOT EXISTS `blacksmith`.`WorkEquipment` (  
  `ID_WorkEquipment` INT(10) AUTO_INCREMENT,  
  `Name` TEXT NOT NULL,  
  `NumOfEquipment` INT NULL,  
  `Condition_ID_Condition` INT(10) NOT NULL,  
  PRIMARY KEY (`ID_WorkEquipment`),  
  INDEX `fk_WorkEquipment_Condition1_idx` (`Condition_ID_Condition` ASC) VISIBLE,  
  CONSTRAINT `fk_WorkEquipment_Condition1`  
    FOREIGN KEY (`Condition_ID_Condition`)  
    REFERENCES `blacksmith`.`Condition` (`ID_Condition`)  
    ON DELETE NO ACTION  
    ON UPDATE NO ACTION)  
ENGINE = InnoDB;
```

```
-- -----  
-- Table `blacksmith`.`WorkshopRoom`  
-- -----
```

```
CREATE TABLE IF NOT EXISTS `blacksmith`.`WorkshopRoom` (  
  `ID_WR` INT(10) AUTO_INCREMENT,  
  `RoomType` TEXT NOT NULL,  
  `WorkEquipment_ID_WorkEquipment` INT(10) NOT NULL,  
  PRIMARY KEY (`ID_WR`),
```

```
INDEX `fk_WorkshopRoom_WorkEquipment1_idx` (`WorkEquipment_ID_WorkEquipment`
ASC) VISIBLE,
CONSTRAINT `fk_WorkshopRoom_WorkEquipment1`
FOREIGN KEY (`WorkEquipment_ID_WorkEquipment`)
REFERENCES `blacksmith`.`WorkEquipment` (`ID_WorkEquipment`)
ON DELETE NO ACTION
ON UPDATE NO ACTION)
ENGINE = InnoDB;
```

```
-- -----
-- Table `blacksmith`.`WorkshopEmployee`
-- -----
```

```
CREATE TABLE IF NOT EXISTS `blacksmith`.`WorkshopEmployee` (
  `ID_WE` INT(10) AUTO_INCREMENT,
  `WESurname` TEXT NOT NULL,
  `WEFirstname` TEXT NOT NULL,
  `WEMiddlename` TEXT NULL,
  `WEBirthDate` DATE NOT NULL,
  `WESpecialization` VARCHAR(20) NOT NULL,
  `WESalary` INT NOT NULL,
  PRIMARY KEY (`ID_WE`))
ENGINE = InnoDB;
```

```
-- -----
-- Table `blacksmith`.`Address`
-- -----
```

```
CREATE TABLE IF NOT EXISTS `blacksmith`.`Address` (
  `ID_Address` INT(10) AUTO_INCREMENT,
  `StreetName` TEXT NOT NULL,
  `HomeNumber` INT NOT NULL,
```


PRIMARY KEY (`ID_Address`))

ENGINE = InnoDB;

-- Table `blacksmith`.`Workshop`

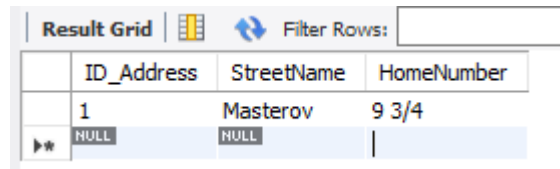
```
CREATE TABLE IF NOT EXISTS `blacksmith`.`Workshop` (  
  `ID_Workshop` INT(10) AUTO_INCREMENT,  
  `WorkshopName` TEXT NOT NULL,  
  `MaterialProvider_ID_MP` INT(10) NOT NULL,  
  `WorkshopBudget_ID_WB` INT(10) NOT NULL,  
  `WorkshopRoom_ID_WR` INT(10) NOT NULL,  
  `WorkshopEmployee_ID_WE` INT(10) NOT NULL,  
  `Address_ID_Address` INT(10) NOT NULL,  
  PRIMARY KEY (`ID_Workshop`, `Address_ID_Address`),  
  INDEX `fk_Workshop_MaterialProvider1_idx` (`MaterialProvider_ID_MP` ASC) VISIBLE,  
  INDEX `fk_Workshop_WorkshopBudget1_idx` (`WorkshopBudget_ID_WB` ASC) VISIBLE,  
  INDEX `fk_Workshop_WorkshopRoom1_idx` (`WorkshopRoom_ID_WR` ASC) VISIBLE,  
  INDEX `fk_Workshop_WorkshopEmployee1_idx` (`WorkshopEmployee_ID_WE` ASC)  
  VISIBLE,  
  INDEX `fk_Workshop_Address1_idx` (`Address_ID_Address` ASC) VISIBLE,  
  CONSTRAINT `fk_Workshop_MaterialProvider1`  
    FOREIGN KEY (`MaterialProvider_ID_MP`)  
    REFERENCES `blacksmith`.`MaterialProvider` (`ID_MP`)  
    ON DELETE NO ACTION  
    ON UPDATE NO ACTION,  
  CONSTRAINT `fk_Workshop_WorkshopBudget1`  
    FOREIGN KEY (`WorkshopBudget_ID_WB`)  
    REFERENCES `blacksmith`.`WorkshopBudget` (`ID_WB`)  
    ON DELETE NO ACTION  
    ON UPDATE NO ACTION,
```

```
CONSTRAINT `fk_Workshop_WorkshopRoom1`  
  FOREIGN KEY (`WorkshopRoom_ID_WR`)  
  REFERENCES `blacksmith`.`WorkshopRoom` (`ID_WR`)  
  ON DELETE NO ACTION  
  ON UPDATE NO ACTION,  
CONSTRAINT `fk_Workshop_WorkshopEmployee1`  
  FOREIGN KEY (`WorkshopEmployee_ID_WE`)  
  REFERENCES `blacksmith`.`WorkshopEmployee` (`ID_WE`)  
  ON DELETE NO ACTION  
  ON UPDATE NO ACTION,  
CONSTRAINT `fk_Workshop_Address1`  
  FOREIGN KEY (`Address_ID_Address`)  
  REFERENCES `blacksmith`.`Address` (`ID_Address`)  
  ON DELETE NO ACTION  
  ON UPDATE NO ACTION)  
ENGINE = InnoDB;
```

```
SET SQL_MODE=@OLD_SQL_MODE;  
SET FOREIGN_KEY_CHECKS=@OLD_FOREIGN_KEY_CHECKS;  
SET UNIQUE_CHECKS=@OLD_UNIQUE_CHECKS;
```

Команды модификации данных

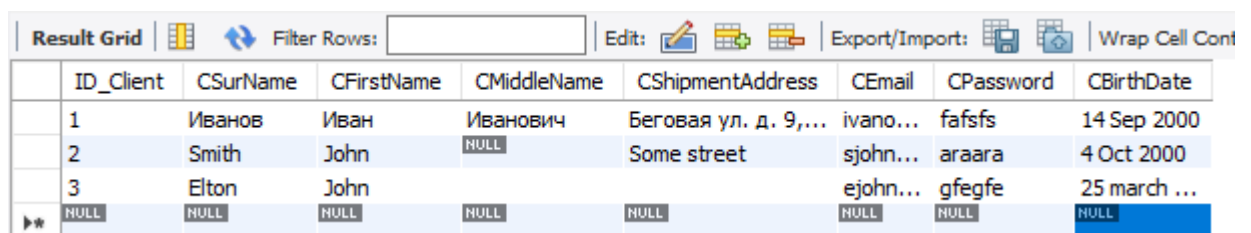
В таблицу address были внесены данные, соответствующие местам нахождения мастерских(Рисунок 32)



	ID_Address	StreetName	HomeNumber
	1	Masterov	9 3/4
▶*	NULL	NULL	

Рисунок 32 – Внесенные данные

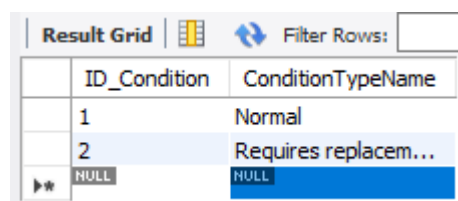
Данные в таблице client соответствуют клиентам, которые собираются воспользоваться услугами(Рисунок 33)



	ID_Client	CSurName	CFirstName	CMiddleName	CShipmentAddress	CEmail	CPassword	CBirthDate
	1	Иванов	Иван	Иванович	Беговая ул. д. 9,...	ivano...	fafsfs	14 Sep 2000
	2	Smith	John	NULL	Some street	sjohn...	araara	4 Oct 2000
	3	Elton	John			ejohn...	gfegfe	25 march ...
▶*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Рисунок 33 – Внесенные данные

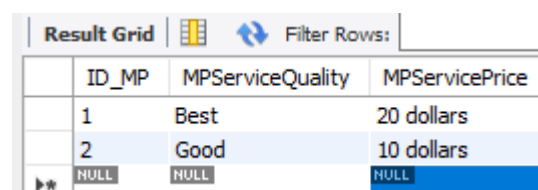
Данные в таблице condition соответствуют состояниям инструментов(Рисунок 34)



	ID_Condition	ConditionTypeName
	1	Normal
	2	Requires replacem...
▶*	NULL	NULL

Рисунок 34 – Внесенные данные

Данные в таблице materialprovider соответствуют информации о поставщиках материалов(Рисунок 35)



	ID_MP	MPServiceQuality	MPServicePrice
	1	Best	20 dollars
	2	Good	10 dollars
▶*	NULL	NULL	NULL

Рисунок 35 – Внесенные данные

Данные в таблице order соответствуют данным о заказах(Рисунок 36)

	ID_Order	Cost	Deadline	Client_ID_Client	ProductType_ID_PT	WorkshopBudget_ID_WB
▶	1	30.85	2021-1...	2	1	1
*	NULL	NULL	NULL	NULL	NULL	NULL

Рисунок 36 – Внесенные данные

Данные в таблице producttype соответствуют предлагаемым вариантам товаров(Рисунок 37)

	ID_PT	ProductTypeName	ProductTypeMaterial	ExtraFeatures
	1	LongSword	Steel	Runes on blade
	2	Ring	Gold	NULL
▶*	NULL	NULL	NULL	NULL

Рисунок 37 – Внесенные данные

Данные в таблице workequipment соответствуют информации об экипировке(Рисунок 38)

	ID_WorkEquipment	Name	NumOfEquipment	Condition_ID_Condition
	1	forge	5	1
	2	anvil	1	2
▶	3	anvil	1	1
*	NULL	NULL	NULL	NULL

Рисунок 38 – Внесенные данные

Данные в таблице workshopbudget соответствуют состоянию бюджета (Рисунок 39)

	ID_WB	Income	Expenses	ModificationDate
	1	534.54	134.32	2021-10-02 18:...
▶*	NULL	NULL	NULL	NULL

Рисунок 39 – Внесенные данные

Данные в таблице workshopemployee отражают информацию о сотрудниках(Рисунок 40)

Result Grid							
	ID_WE	WESurname	WEFirstname	WEMiddlename	WEBirthDate	WESpecialization	WESalary
	1	Ertok	Huseyn	Ibrahimovich	2001-04-13	Jeweller	30.50
▶	2	Avenici	Adriana	NULL	1990-06-12	Master Blacksmith	50.00
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Рисунок 40 – Внесенные данные

Данные в таблице workshoproom отражают информацию о помещениях(Рисунок 41)

Result Grid			
	ID_WR	RoomType	WorkEquipment_ID_WorkEquipment
	1	Smithy	1
	2	Smithy	2
	3	Jewelry w...	1
	4	Jewelry w...	3
▶*	NULL	NULL	NULL

Рисунок 41 – Внесенные данные

Данные в таблице workshop отражают информацию о мастерской в целом(Рисунок 42)

Result Grid							
	ID_Workshop	WorkshopName	MaterialProvider_ID_MP	WorkshopBudget_ID_WB	WorkshopRoom_ID_WR	WorkshopEmployee_ID_WE	Address_ID_Address
	1	Tar-Tar by Maris	2	1	1	2	1
▶	2	Tar-Tar by Maris	1	1	3	1	1
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Рисунок 42 – Внесенные данные

Выборка данных. Оператор SELECT

Операция проекции (Рисунок 43)

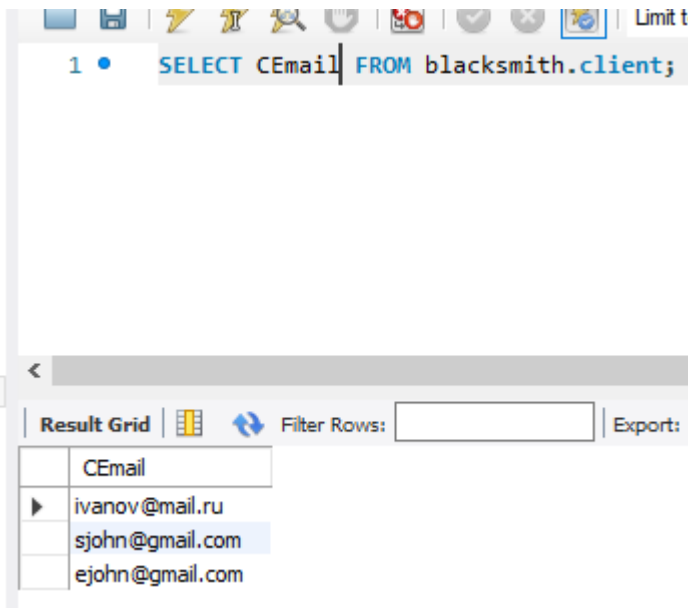


Рисунок 43 – Проекция

Операция селекции (Рисунок 44)

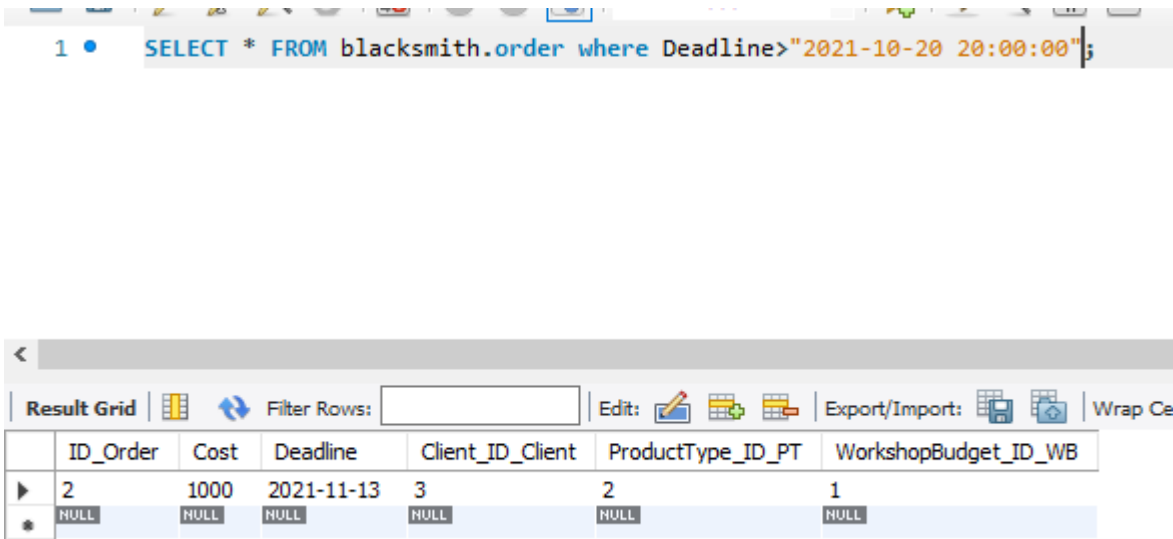
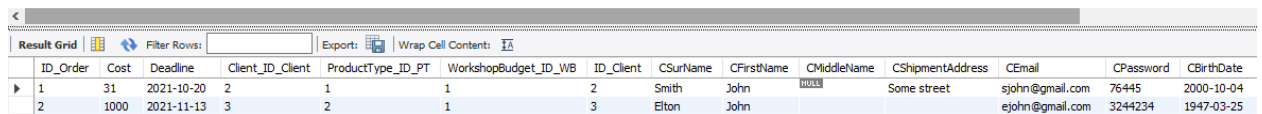


Рисунок 44 – Селекция

Операция соединения(Рисунок 45)

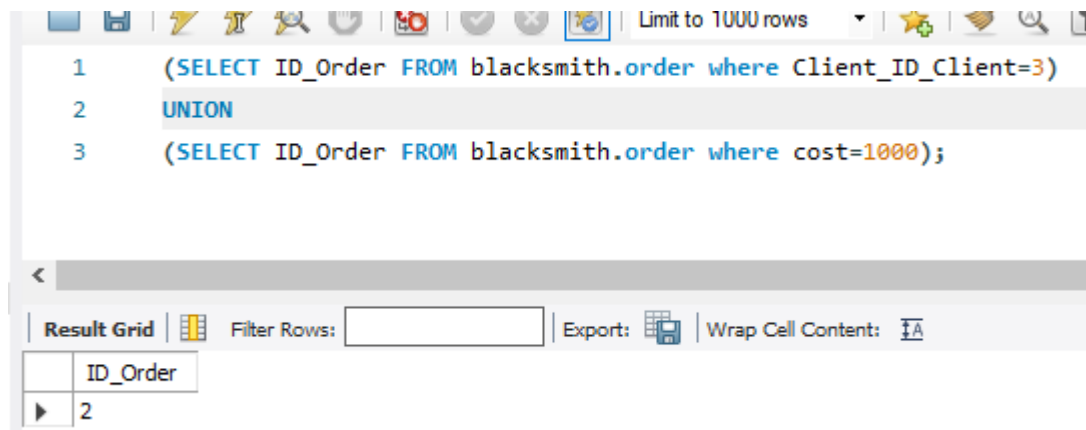
```
1 • SELECT * FROM blacksmith.order o left outer join blacksmith.client c
2   on o.Client_ID_Client = c.ID_Client;
```



ID_Order	Cost	Deadline	Client_ID_Client	ProductType_ID_PT	WorkshopBudget_ID_WB	ID_Client	CSurName	CFirstName	CMiddleName	CShipmentAddress	CEmail	CPassword	CBirthDate
1	31	2021-10-20	2	1	1	2	Smith	John	NULL	Some street	sjohn@gmail.com	76445	2000-10-04
2	1000	2021-11-13	3	2	1	3	Elton	John			ejohn@gmail.com	3244234	1947-03-25

Рисунок 45 – Соединение

Операция объединения(Рисунок 46)



```
1 (SELECT ID_Order FROM blacksmith.order where Client_ID_Client=3)
2 UNION
3 (SELECT ID_Order FROM blacksmith.order where cost=1000);
```

ID_Order
2

Рисунок 46 – Объединение

Создание триггеров.

Был создан триггер, который при определенной цене заказа уведомляет о необходимости сделать скидку

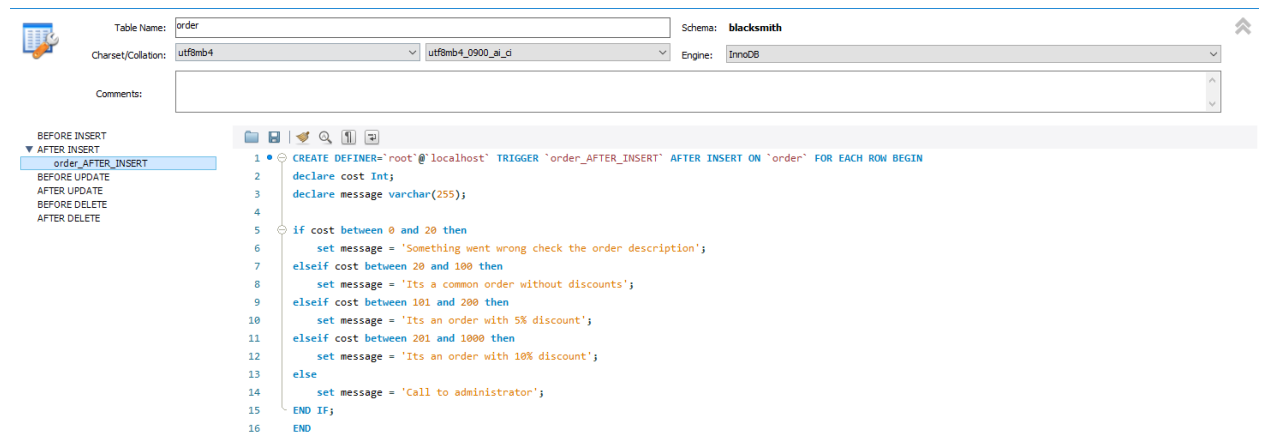


Рисунок 47 – Код триггера

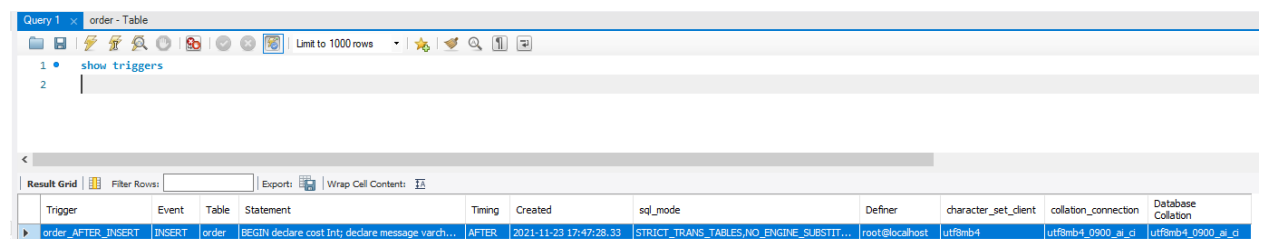


Рисунок 48 – Хранение триггера

Создание хранимых процедур

Вызов всех крайних сроков из “order” при помощи хранимой процедуры

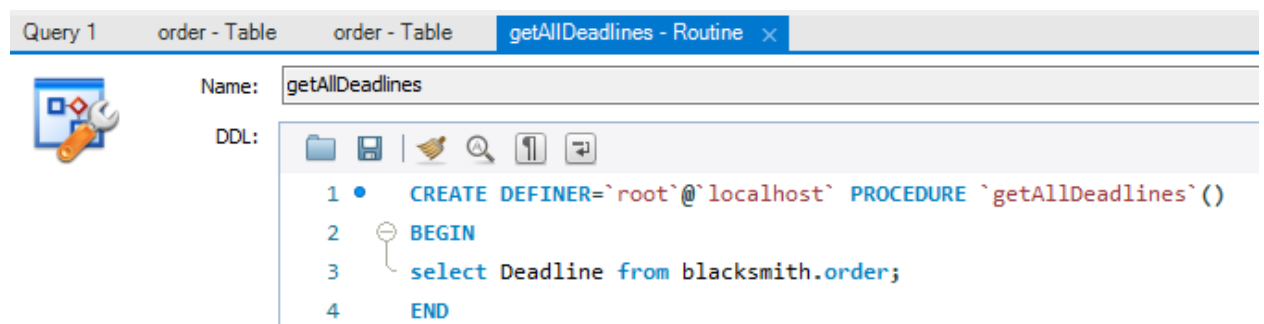


Рисунок 49 – Код процедуры

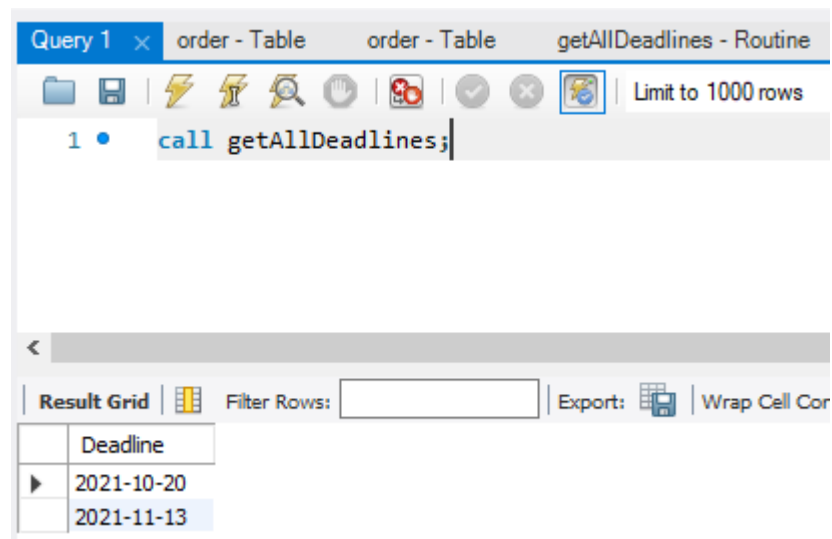


Рисунок 50 – Вызов процедуры

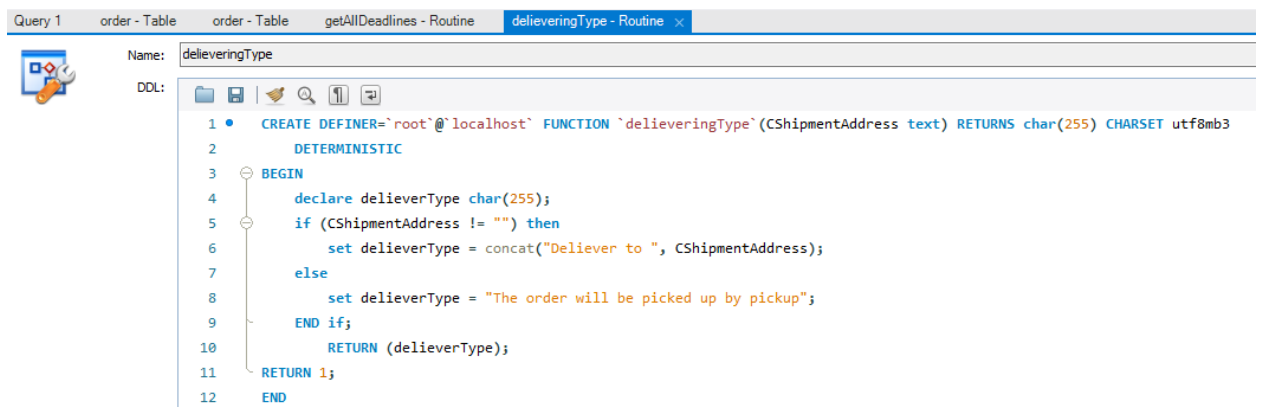


Рисунок 51 – Код функции

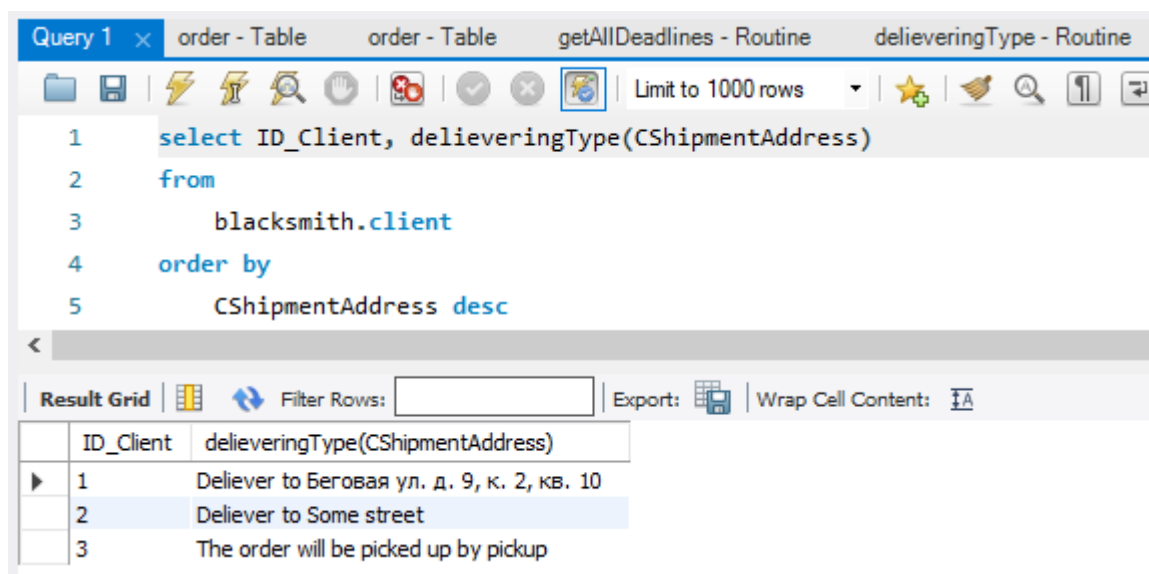


Рисунок 52 – Вызов функции

Резервное копирование

Здесь было выполнено копирование базы данных blacksmith:

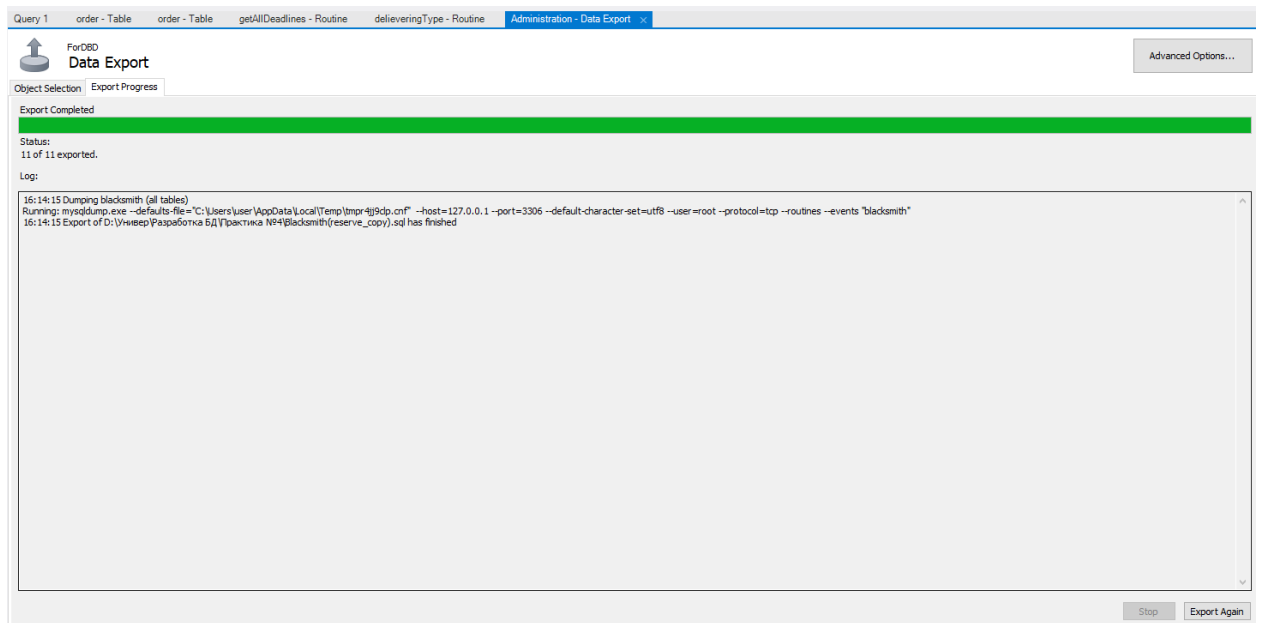


Рисунок 53 – Уведомление об успешном создании резервной копии

Вывод

В ходе выполнения данной работы были получены базовые навыки:

1. По проектированию логической и физической моделей баз данных
2. По написанию базы данных в командной строке MySQL CommandLine
3. По работе с запросами внутри базы данных
4. Работы с MySQL Workbench

Список использованных источников и литературы:

1. Лекции по предмету «Разработка баз данных» Богомольной Г.В.
2. Владимир Репин. Бизнес-процессы: моделирование, внедрение, управление – Москва: Живой язык, 2020. – 470 с.