**МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ**

**РОССИЙСКОЙ ФЕДЕРАЦИИ**

**Федеральное государственное бюджетное образовательное учреждение**

**высшего образования**

**«Казанский государственный энергетический»**

**Отчет по лабораторной работе 2**

РЕАЛИЗАЦИЯ БАЗЫ ДАННЫХ С ПОМОЩЬЮ СУБД MICROSOFT SQL SERVER

Выполнил:

студент группы ПИ-1-22

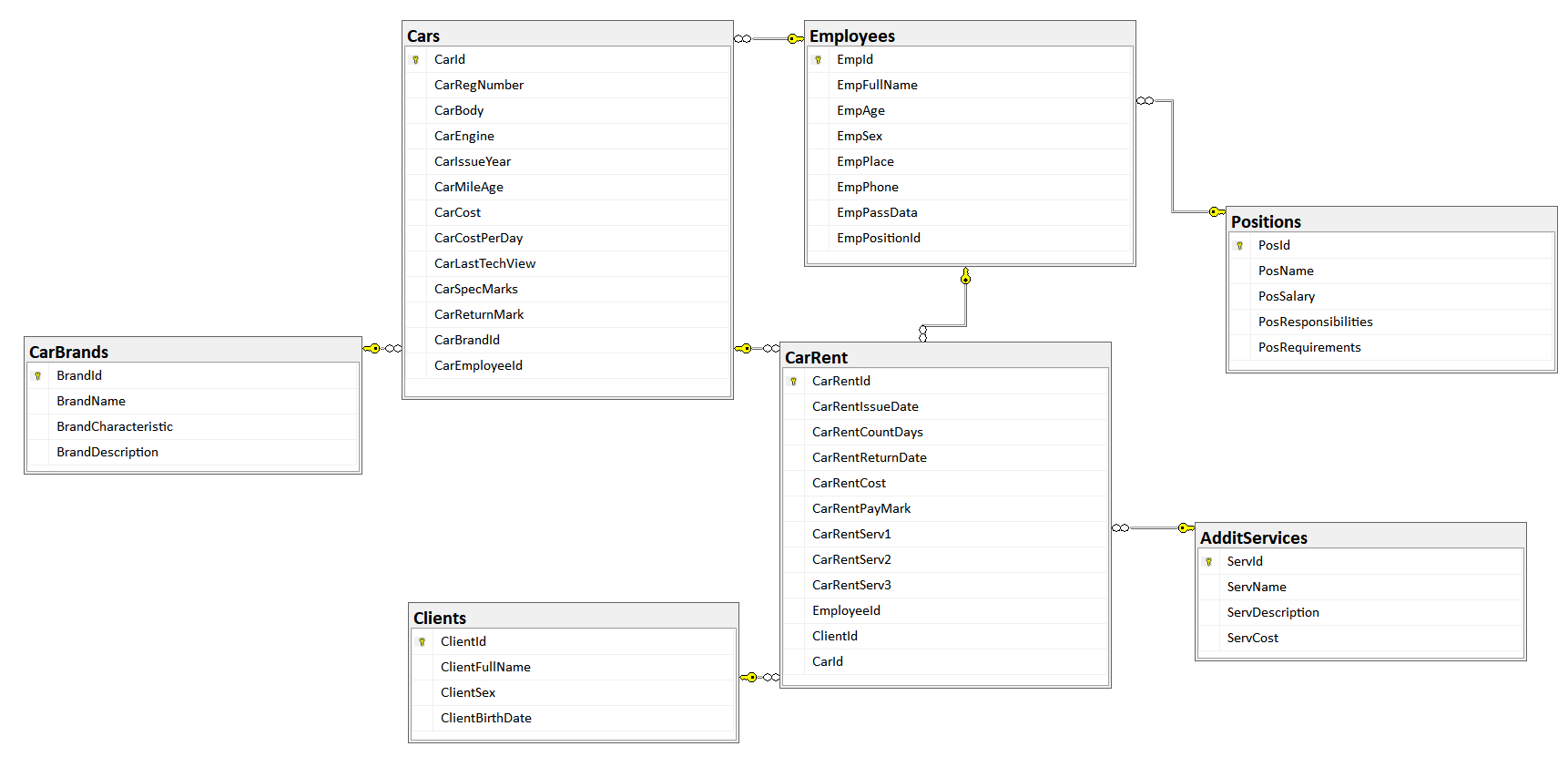
Соловьёв Леонид Александрович

Проверил:

Доц. Хамитов Ренат Минзашарифович

Казань 2023

Диаграмма БД:

  
SQL-код:

USE master;

GO

-- Удаление базы данных stroy, если она существует

IF EXISTS (SELECT name FROM sys.databases WHERE name = 'CarRental')

BEGIN

ALTER DATABASE CarRental SET SINGLE\_USER WITH ROLLBACK IMMEDIATE;

DROP DATABASE CarRental

END

--Создание новой базы данных stroy

USE [master]

GO

/\*\*\*\*\*\* Object: Database [CarRental] Script Date: 10/13/2023 11:11:01 AM \*\*\*\*\*\*/

CREATE DATABASE [CarRental]

CONTAINMENT = NONE

ON PRIMARY

( NAME = N'CarRental', FILENAME = N'C:\my\_codes\_university\Databases\LabWorks\LabWork2\CarRental.mdf' , SIZE = 8192KB , MAXSIZE = UNLIMITED, FILEGROWTH = 65536KB )

LOG ON

( NAME = N'CarRental\_log', FILENAME = N'C:\my\_codes\_university\Databases\LabWorks\LabWork2\CarRental\_log.ldf' , SIZE = 8192KB , MAXSIZE = 2048GB , FILEGROWTH = 65536KB )

WITH CATALOG\_COLLATION = DATABASE\_DEFAULT, LEDGER = OFF

GO

IF (1 = FULLTEXTSERVICEPROPERTY('IsFullTextInstalled'))

begin

EXEC [CarRental].[dbo].[sp\_fulltext\_database] @action = 'enable'

end

GO

ALTER DATABASE [CarRental] SET ANSI\_NULL\_DEFAULT OFF

GO

ALTER DATABASE [CarRental] SET ANSI\_NULLS OFF

GO

ALTER DATABASE [CarRental] SET ANSI\_PADDING OFF

GO

ALTER DATABASE [CarRental] SET ANSI\_WARNINGS OFF

GO

ALTER DATABASE [CarRental] SET ARITHABORT OFF

GO

ALTER DATABASE [CarRental] SET AUTO\_CLOSE OFF

GO

ALTER DATABASE [CarRental] SET AUTO\_SHRINK OFF

GO

ALTER DATABASE [CarRental] SET AUTO\_UPDATE\_STATISTICS ON

GO

ALTER DATABASE [CarRental] SET CURSOR\_CLOSE\_ON\_COMMIT OFF

GO

ALTER DATABASE [CarRental] SET CURSOR\_DEFAULT GLOBAL

GO

ALTER DATABASE [CarRental] SET CONCAT\_NULL\_YIELDS\_NULL OFF

GO

ALTER DATABASE [CarRental] SET NUMERIC\_ROUNDABORT OFF

GO

ALTER DATABASE [CarRental] SET QUOTED\_IDENTIFIER OFF

GO

ALTER DATABASE [CarRental] SET RECURSIVE\_TRIGGERS OFF

GO

ALTER DATABASE [CarRental] SET DISABLE\_BROKER

GO

ALTER DATABASE [CarRental] SET AUTO\_UPDATE\_STATISTICS\_ASYNC OFF

GO

ALTER DATABASE [CarRental] SET DATE\_CORRELATION\_OPTIMIZATION OFF

GO

ALTER DATABASE [CarRental] SET TRUSTWORTHY OFF

GO

ALTER DATABASE [CarRental] SET ALLOW\_SNAPSHOT\_ISOLATION OFF

GO

ALTER DATABASE [CarRental] SET PARAMETERIZATION SIMPLE

GO

ALTER DATABASE [CarRental] SET READ\_COMMITTED\_SNAPSHOT OFF

GO

ALTER DATABASE [CarRental] SET HONOR\_BROKER\_PRIORITY OFF

GO

ALTER DATABASE [CarRental] SET RECOVERY FULL

GO

ALTER DATABASE [CarRental] SET MULTI\_USER

GO

ALTER DATABASE [CarRental] SET PAGE\_VERIFY CHECKSUM

GO

ALTER DATABASE [CarRental] SET DB\_CHAINING OFF

GO

ALTER DATABASE [CarRental] SET FILESTREAM( NON\_TRANSACTED\_ACCESS = OFF )

GO

ALTER DATABASE [CarRental] SET TARGET\_RECOVERY\_TIME = 60 SECONDS

GO

ALTER DATABASE [CarRental] SET DELAYED\_DURABILITY = DISABLED

GO

ALTER DATABASE [CarRental] SET ACCELERATED\_DATABASE\_RECOVERY = OFF

GO

ALTER DATABASE [CarRental] SET QUERY\_STORE = ON

GO

ALTER DATABASE [CarRental] SET QUERY\_STORE (OPERATION\_MODE = READ\_WRITE, CLEANUP\_POLICY = (STALE\_QUERY\_THRESHOLD\_DAYS = 30), DATA\_FLUSH\_INTERVAL\_SECONDS = 900, INTERVAL\_LENGTH\_MINUTES = 60, MAX\_STORAGE\_SIZE\_MB = 1000, QUERY\_CAPTURE\_MODE = AUTO, SIZE\_BASED\_CLEANUP\_MODE = AUTO, MAX\_PLANS\_PER\_QUERY = 200, WAIT\_STATS\_CAPTURE\_MODE = ON)

GO

ALTER DATABASE [CarRental] SET READ\_WRITE

GO

use CarRental;

CREATE TABLE Positions (

PosId INT PRIMARY KEY IDENTITY,

PosName varchar(40) NOT NULL unique,

PosSalary numeric(10, 3),

PosResponsibilities VARCHAR(100),

PosRequirements VARCHAR(100)

)

CREATE TABLE Employees (

EmpId INT PRIMARY KEY IDENTITY,

EmpFullName VARCHAR(100) NOT NULL,

EmpAge INT not null

CONSTRAINT CK\_Emp\_EmpAge CHECK(EmpAge > 17 AND EmpAge < 100),

EmpSex VARCHAR(6) not null

CONSTRAINT CK\_Emp\_EmpSex CHECK(EmpSex = 'Male' OR EmpSex = 'Female'),

EmpPlace VARCHAR(100),

EmpPhone VARCHAR(11) NOT NULL unique,

EmpPassData NUMERIC(10, 0) unique,

EmpPositionId INT REFERENCES Positions (PosId)

)

create table CarBrands (

BrandId INT PRIMARY KEY IDENTITY,

BrandName VARCHAR(20) NOT NULL,

BrandCharacteristic VARCHAR(200),

BrandDescription VARCHAR(100)

)

create table Cars (

CarId int primary key identity,

CarRegNumber varchar(9) unique,

CarBody int

constraint CH\_Car\_CarBody check(CarBody >= 0),

CarEngine int

constraint CH\_Car\_CarEngine check(CarEngine >= 0),

CarIssueYear date

constraint CH\_Car\_CarIssueYear check(datediff(year, '1990-01-01', CarIssueYear) > 0),

CarMileAge numeric(10, 3)

constraint CH\_Car\_CarMileage check(CarMileAge >= 0 and CarMileAge <= 9999999),

CarCost numeric(12, 3)

constraint CH\_Car\_CarCost check(CarCost >= 0 and CarCost <= 999999999.999),

CarCostPerDay numeric(9, 2) not null

constraint CH\_Car\_CarCostPerDay check(CarCostPerDay > 0 and CarCostPerDay <= 9999999.999),

CarLastTechView date,

CarSpecMarks varchar(100),

CarReturnMark varchar(3),

CarBrandId int references CarBrands (BrandId),

CarEmployeeId int references Employees (EmpId)

)

create table Clients (

ClientId int primary key identity,

ClientFullName VARCHAR(100) NOT NULL,

ClientSex VARCHAR(6) not null

CONSTRAINT CK\_Client\_Sex CHECK(ClientSex = 'Male' OR ClientSex = 'Female'),

ClientBirthDate date NOT NULL

constraint CK\_Client\_BirthDate check(datediff(year, ClientBirthDate, getdate()) > 17)

)

create table AdditServices (

ServId int primary key identity,

ServName varchar(100) not null,

ServDescription varchar(100),

ServCost numeric(10, 3)

constraint CH\_Car\_Mileage check(ServCost > 0 and ServCost < 9999999)

)

create table CarRent (

CarRentId int primary key identity,

CarRentIssueDate date not null,

CarRentCountDays int not null

constraint CH\_CarRent\_CarRentCountDays check(CarRentCountDays > 0),

CarRentReturnDate date,

CarRentCost numeric(10, 3) not null

constraint CH\_Car\_CarRentCost check(CarRentCost > 0 and CarRentCost < 9999999),

CarRentPayMark varchar(3) not null,

CarRentServ1 int references AdditServices (ServId),

CarRentServ2 int references AdditServices (ServId),

CarRentServ3 int references AdditServices (ServId),

EmployeeId int references Employees (EmpId),

ClientId int references Clients (ClientId),

CarId int references Cars (CarId)

)

insert into CarBrands (BrandName, BrandCharacteristic, BrandDescription) values ('Toyota', 'Приятные машинки', 'Это что? Супра? Супра классная'),

('BMW', 'Машинки для любителей', 'Часто ездят в ТО'),

('Bugatti', 'Дорогущие машинки', 'Легкая встреча со столбом'),

('Mercedes', 'Премиум машинки', 'Элита'),

('Volvo', 'Безопасные машинки', 'Полубоги')

insert into Clients (ClientFullName, ClientSex, ClientBirthDate) values ('Соловьёв Леонид Александрович', 'Male', '2004-12-27'),

('Иванова Ирина Александровна', 'Female', '2000-01-01'),

('Иванов Иван Иванович', 'Male', '1990-12-01'),

('Иванов Иван Петрович', 'Male', '1990-12-02'),

('Иванов Иван Денисович', 'Male', '1990-12-03')

insert into Positions (PosName, PosSalary, PosResponsibilities, PosRequirements) values ('Директор', 3000000.00, 'Существовать, решать дела', 'Быть предприимчивым')

insert into Positions (PosName, PosSalary) values ('Механик-инженер', 75000.00),

('Менеджер', 125000.00),

('Механик-электрик', 125000.00),

('Разработчик сайтов', 0.00)

insert into Employees (EmpFullName, EmpAge, EmpSex, EmpPhone, EmpPassData, EmpPositionId) values ('Иванов Иван Иванович', 30, 'Male', '11111111111', '1111111111', 1),

('Петров Петр Петрович', 19, 'Male', '22222222222', '2222222222', 3),

('Дмитриев Дмитрий Дмитриевич', 20, 'Male', '33333333333', '3333333333', 2),

('Маликов Дмитрий Анатольевич', 40, 'Male', '44444444444', '4444444444', 2),

('Андреева Мива Андреевна', 24, 'Female', '55555555555', '5555555555', 3),

('Асгардов Локи Лафейсон', 27, 'Male', '66666666666', '6666666666', 2),

('Асгардов Тор Одинсон', 28, 'Male', '77777777777', '7777777777', 4),

('Мидгардов Тони Старкович', 45, 'Male', '88888888888', '8888888888', 4),

('Терентьев Михаил Павлович', 29, 'Male', '99999999999', '9999999999', 4),

('Соловьёв Леонид Александрович', 18, 'Male', '79003289471', '1000000000', 5)

insert into Cars (CarRegNumber, CarMileAge, CarCostPerDay, CarReturnMark, CarBrandId, CarEmployeeId) values ('A111БУ16', 27123.82, 2500, 'YES', 1, 3),

('A222БУ16', 127123.82, 4000, 'YES', 2, 4),

('A333БУ16', 0, 2500, 'YES', 1, 3),

('A444БУ16', 100000, 10000, 'YES', 3, 6),

('A555БУ16', 120000, 10000, 'YES', 4, 4),

('A666БУ16', 15000, 6000, 'YES', 4, 4),

('A777БУ16', 10000, 50000, 'YES', 5, 4)

insert into Cars (CarRegNumber, CarMileAge, CarCostPerDay, CarReturnMark, CarBrandId) values ('A888БУ16', 23002, 2500, 'NO', 1),

('A999БУ16', 17000, 5000, 'NO', 4),

('A000БУ16', 15000, 5000, 'NO', 4)

insert into AdditServices (ServName, ServDescription, ServCost) values ('Электрика', 'Починка коробки', 15000),

('Внешний вид', 'Вправление вмятин', 16100),

('Внешний вид', 'Замена фар', 10000),

('Внешний вид', 'Подкачка шин', 1000),

('Внешний вид', 'Покраска кузова', 20000)

insert into CarRent (CarRentIssueDate, CarRentCountDays, CarId, CarRentCost, CarRentPayMark, CarRentServ1, ClientId) values ('2023-10-11', 1, 1, 2500, 'YES', 1, 1),

('2023-10-12', 1, 2, 4000, 'YES', 1, 1),

('2023-10-13', 1, 3, 2500, 'YES', 1, 1),

('2023-10-11', 1, 4, 10000, 'YES', 2, 1),

('2023-10-12', 1, 5, 10000, 'YES', 2, 1),

('2023-10-13', 1, 6, 6000, 'YES', 2, 1)

insert into CarRent (CarRentIssueDate, CarRentCountDays, CarId, CarRentCost, CarRentPayMark, CarRentServ1, CarRentServ2, ClientId) values ('2023-10-13', 1, 10, 5000, 'NO', 3, 2, 1)

insert into CarRent (CarRentIssueDate, CarRentCountDays, CarId, CarRentCost, CarRentPayMark, ClientId) values ('2023-10-10', 1, 7, 50000, 'NO', 1),

('2023-10-11', 1, 8, 2500, 'NO', 1),

('2023-10-12', 1, 9, 5000, 'NO', 1)

select \* from AdditServices;

select \* from CarBrands;

select \* from CarRent;

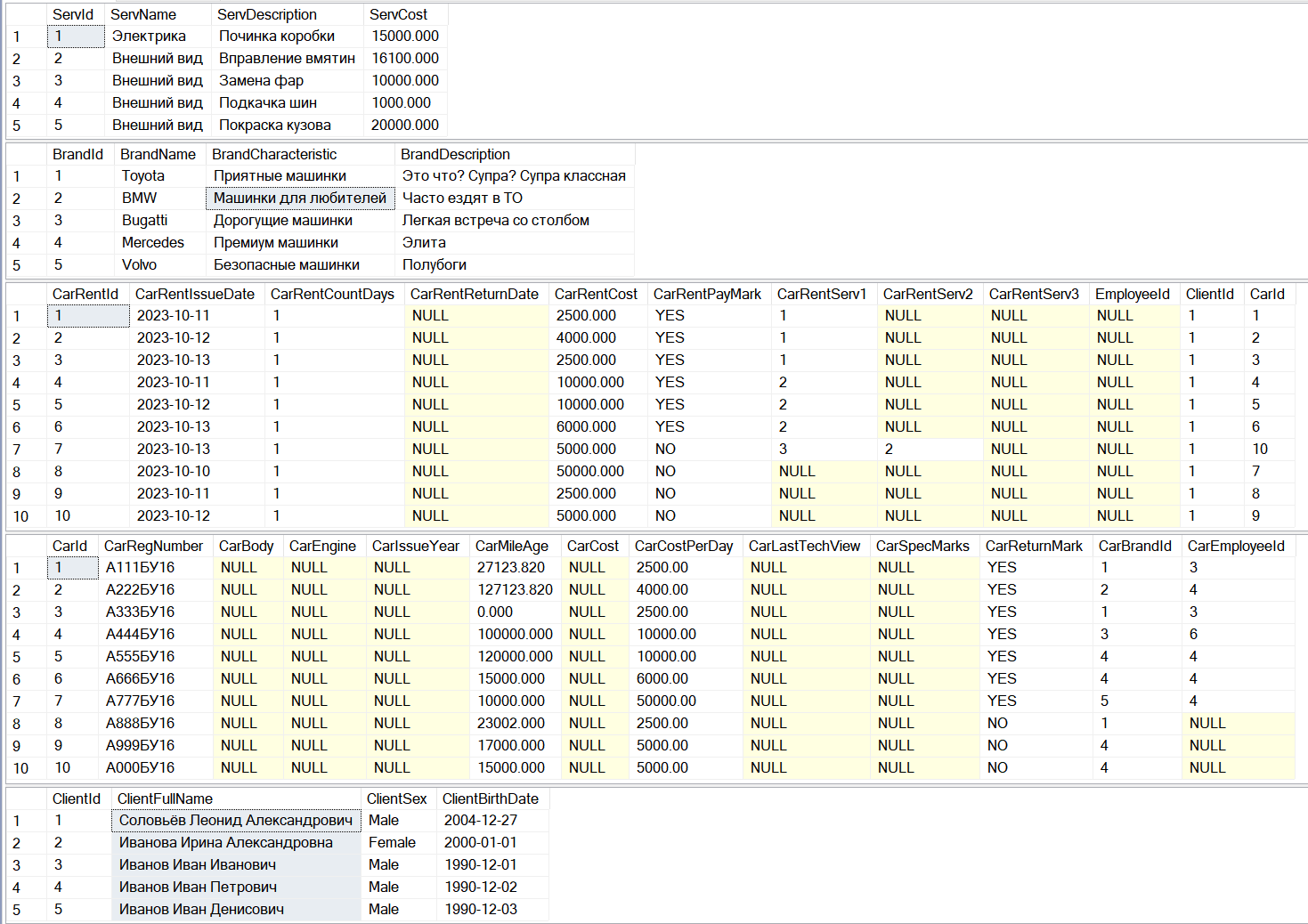
select \* from Cars;

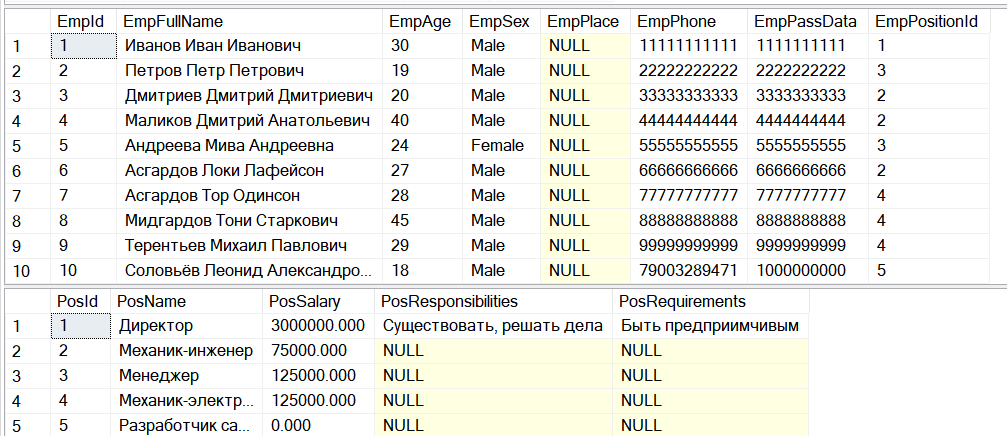
select \* from Clients;

select \* from Employees;

select \* from Positions;

Результат работы кода:





Пример обновления данных(Увеличить количество дней и стоимость машины с id, равным 10)

select \* from CarRent;

update CarRent

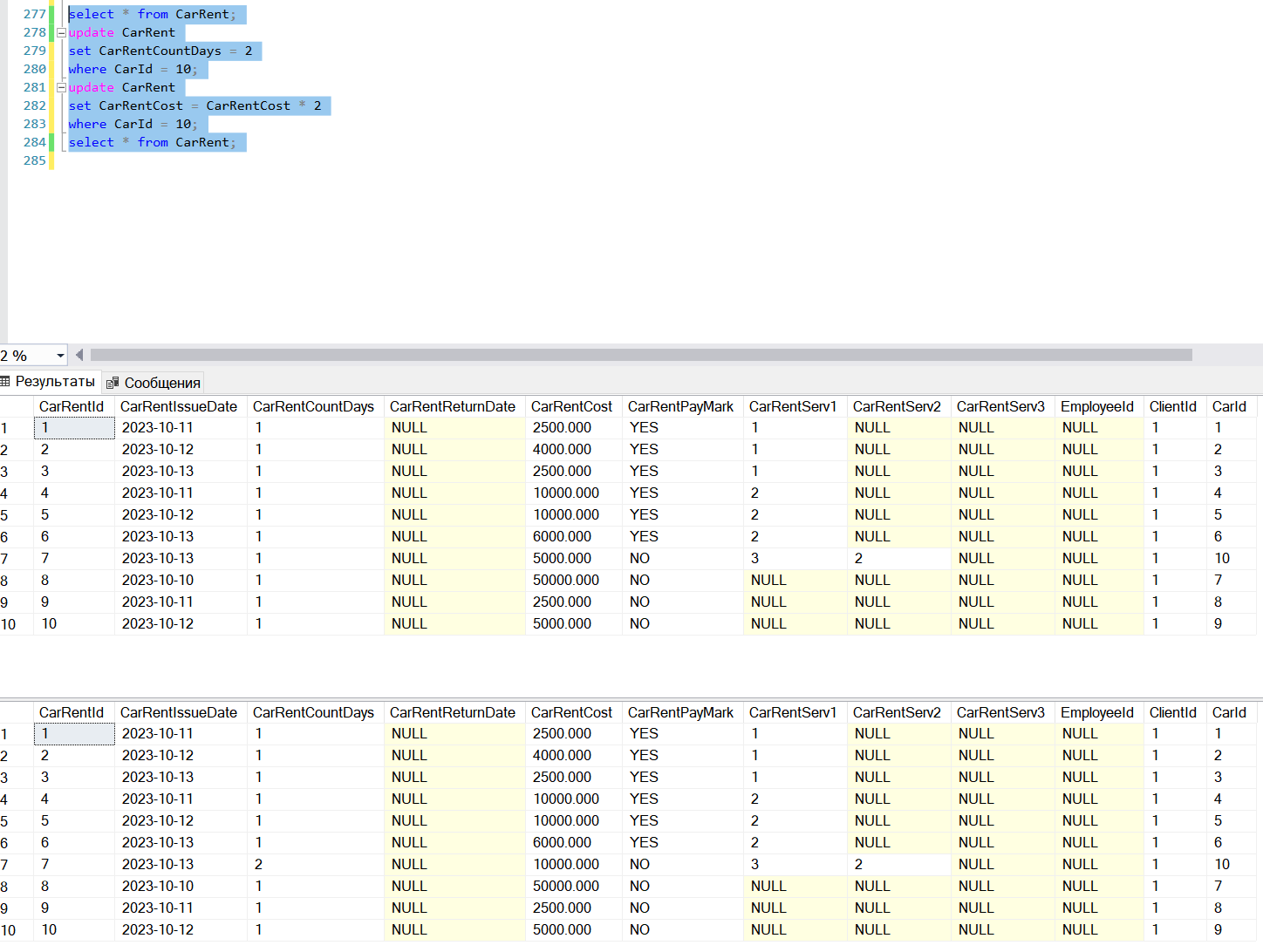
set CarRentCountDays = 2

where CarId = 10;

update CarRent

set CarRentCost = CarRentCost \* 2

where CarId = 10;

select \* from CarRent;  


Пример удаления данных  
delete from CarRent where CarId = 10;

select \*from CarRent;  
