

Министерство науки и высшего образования Российской Федерации
Федеральное государственное автономное образовательное
учреждение высшего образования
«НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ ИТМО»
Факультет инфокоммуникационных технологий

ОТЧЕТ
О ЛАБОРАТОРНОЙ РАБОТЕ № 3
по теме: Создание таблиц базы данных PostgreSQL.
Заполнение таблиц рабочими данными
по дисциплине: Проектирование и реализация баз данных

Специальность:
45.03.04 Интеллектуальные системы в гуманитарной сфере

Проверил:
Говорова М.М. _____
Дата: «__» _____ 20__ г.
Оценка _____

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Санкт-Петербург 2020/2021

Цель работы: овладеть практическими навыками создания таблиц базы данных PostgreSQL 1X, заполнения их рабочими данными, резервного копирования и восстановления БД.

Оборудование: компьютерный класс.

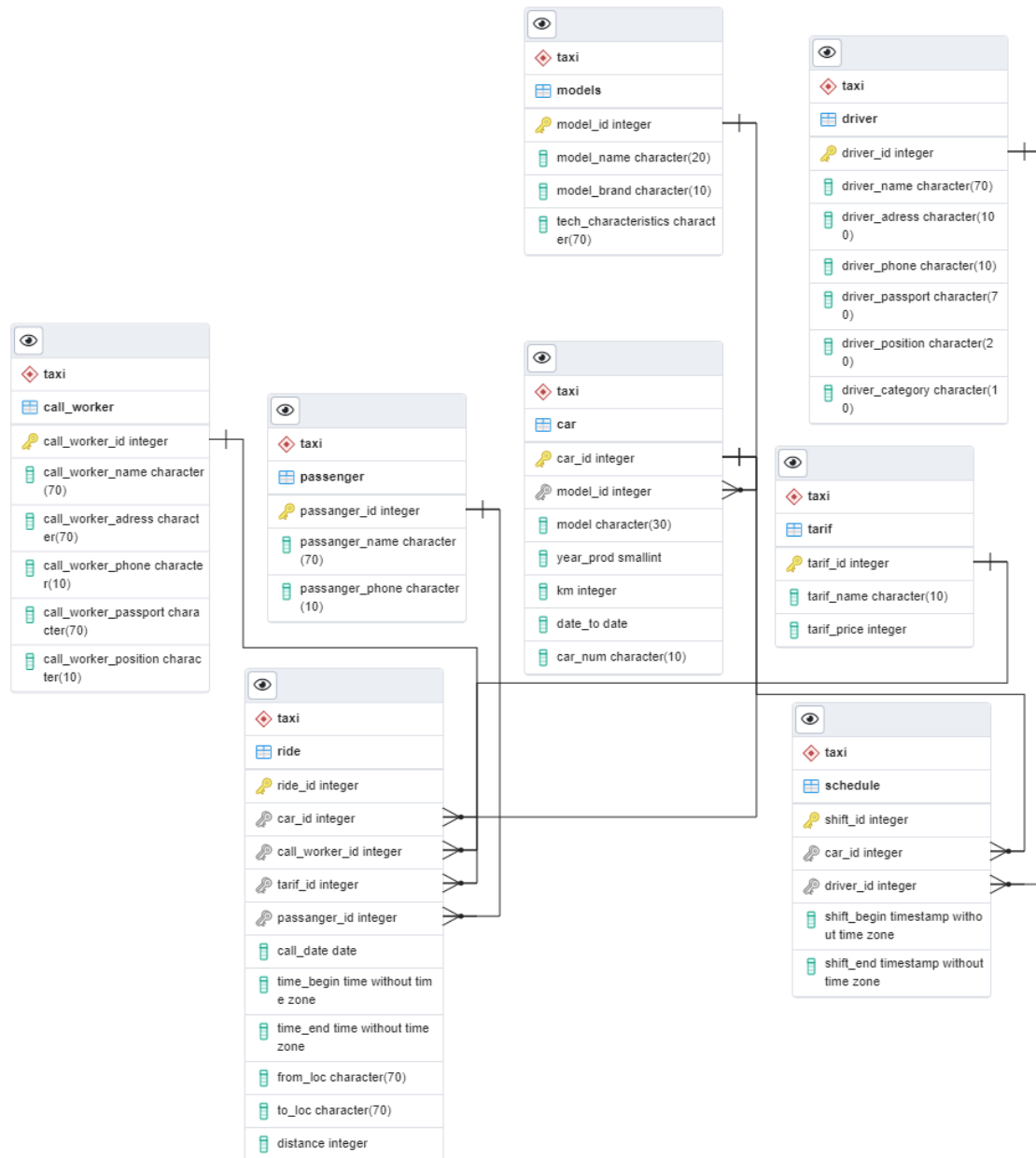
Программное обеспечение: СУБД PostgreSQL 1X, pgAdmin 4.

Практическое задание:

1. Создать базу данных с использованием pgAdmin 4 (согласно индивидуальному заданию).
2. Создать схему в составе базы данных.
3. Создать таблицы базы данных.
4. Установить ограничения на данные: *Primary Key, Unique, Check, Foreign Key*.
5. Заполнить таблицы БД рабочими данными.
6. Создать резервную копию БД.

БД: taxi service

ERD диаграмма:



Dump:

```
--  
-- PostgreSQL database dump  
--  
  
-- Dumped from database version 11.12  
-- Dumped by pg_dump version 11.12
```

-- Started on 2021-06-22 16:18:01

```
SET statement_timeout = 0;
SET lock_timeout = 0;
SET idle_in_transaction_session_timeout = 0;
SET client_encoding = 'UTF8';
SET standard_conforming_strings = on;
SELECT pg_catalog.set_config('search_path', '', false);
SET check_function_bodies = false;
SET xmloption = content;
SET client_min_messages = warning;
SET row_security = off;
```

```
--
-- TOC entry 7 (class 2615 OID 24576)
-- Name: taxi; Type: SCHEMA; Schema: -; Owner: postgres
--
```

```
CREATE SCHEMA taxi;
```

```
ALTER SCHEMA taxi OWNER TO postgres;
```

```
SET default_tablespace = '';
```

```
SET default_with_oids = false;
```

```
--
-- TOC entry 202 (class 1259 OID 24626)
-- Name: call_worker; Type: TABLE; Schema: taxi; Owner: postgres
--
```

```
CREATE TABLE taxi.call_worker (
    call_worker_id integer NOT NULL,
    call_worker_name character(70) NOT NULL,
    call_worker_adress character(70),
    call_worker_phone character(10) NOT NULL,
    call_worker_passport character(70) NOT NULL,
    call_worker_position character(10) NOT NULL
);
```

```
ALTER TABLE taxi.call_worker OWNER TO postgres;
```

```
--  
-- TOC entry 198 (class 1259 OID 24582)  
-- Name: car; Type: TABLE; Schema: taxi; Owner: postgres  
--
```

```
CREATE TABLE taxi.car (  
    car_id integer NOT NULL,  
    model_id integer NOT NULL,  
    model character(30) NOT NULL,  
    year_prod smallint,  
    km integer NOT NULL,  
    date_to date NOT NULL,  
    car_num character(10) NOT NULL  
);
```

```
ALTER TABLE taxi.car OWNER TO postgres;
```

```
--  
-- TOC entry 197 (class 1259 OID 24577)  
-- Name: driver; Type: TABLE; Schema: taxi; Owner: postgres  
--
```

```
CREATE TABLE taxi.driver (  
    driver_id integer NOT NULL,  
    driver_name character(70) NOT NULL,  
    driver_adress character(100),  
    driver_phone character(10) NOT NULL,  
    driver_passport character(70) NOT NULL,  
    driver_position character(20) NOT NULL,  
    driver_category character(10)  
);
```

```
ALTER TABLE taxi.driver OWNER TO postgres;
```

```
--  
-- TOC entry 200 (class 1259 OID 24606)  
-- Name: models; Type: TABLE; Schema: taxi; Owner: postgres  
--
```

```
CREATE TABLE taxi.models (  
    model_id integer NOT NULL,  
    model_name character(20) NOT NULL,
```

```
    model_brand character(10) NOT NULL,  
    tech_characteristics character(70) NOT NULL  
);
```

```
ALTER TABLE taxi.models OWNER TO postgres;
```

```
--  
-- TOC entry 203 (class 1259 OID 24633)  
-- Name: passenger; Type: TABLE; Schema: taxi; Owner: postgres  
--
```

```
CREATE TABLE taxi.passenger (  
    passanger_id integer NOT NULL,  
    passanger_name character(70) NOT NULL,  
    passanger_phone character(10) NOT NULL  
);
```

```
ALTER TABLE taxi.passenger OWNER TO postgres;
```

```
--  
-- TOC entry 201 (class 1259 OID 24616)  
-- Name: ride; Type: TABLE; Schema: taxi; Owner: postgres  
--
```

```
CREATE TABLE taxi.ride (  
    ride_id integer NOT NULL,  
    car_id integer NOT NULL,  
    call_worker_id integer NOT NULL,  
    tarif_id integer NOT NULL,  
    passanger_id integer NOT NULL,  
    call_date date NOT NULL,  
    time_begin time without time zone,  
    time_end time without time zone,  
    from_loc character(70) NOT NULL,  
    to_loc character(70) NOT NULL,  
    distance integer NOT NULL  
);
```

```
ALTER TABLE taxi.ride OWNER TO postgres;
```

```
--
```

```
-- TOC entry 199 (class 1259 OID 24591)
-- Name: schedule; Type: TABLE; Schema: taxi; Owner: postgres
--
```

```
CREATE TABLE taxi.schedule (
    shift_id integer NOT NULL,
    car_id integer NOT NULL,
    driver_id integer NOT NULL,
    shift_begin timestamp without time zone NOT NULL,
    shift_end timestamp without time zone NOT NULL
);
```

```
ALTER TABLE taxi.schedule OWNER TO postgres;
```

```
--
-- TOC entry 204 (class 1259 OID 24646)
-- Name: tarif; Type: TABLE; Schema: taxi; Owner: postgres
--
```

```
CREATE TABLE taxi.tarif (
    tarif_id integer NOT NULL,
    tarif_name character(10),
    tarif_price integer NOT NULL
);
```

```
ALTER TABLE taxi.tarif OWNER TO postgres;
```

```
--
-- TOC entry 2879 (class 0 OID 24626)
-- Dependencies: 202
-- Data for Name: call_worker; Type: TABLE DATA; Schema: taxi; Owner:
postgres
--
```

```
COPY taxi.call_worker (call_worker_id, call_worker_name, call_worker_adress,
call_worker_phone, call_worker_passport, call_worker_position) FROM stdin;
1    Martynova Anna Victorovna                \N    9786359811
      4156 734678                                call_work
2    Mikhaylyk Elena Petrovna                  \N    9780091622
      4156 398009                                call_work
\.
```

```
--
-- TOC entry 2875 (class 0 OID 24582)
-- Dependencies: 198
-- Data for Name: car; Type: TABLE DATA; Schema: taxi; Owner: postgres
--
```

```
COPY taxi.car (car_id, model_id, model, year_prod, km, date_to, car_num)
FROM stdin;
```

1	5	Fortuner	2015	5000	2021-01-16	k228ek
2	2	Rio	2017	6054	2021-02-16	t262ed
3	1	Solaris	2018	4054	2021-01-26	s724jx
4	3	Duster	2019	5832	2021-03-09	x872nj
5	4	Sandero	2016	12083	2021-04-18	a624je
6	1	Solaris	2020	6083	2021-04-04	k835fr
7	2	Rio	2012	250001	2020-06-09	y543gf
8	5	Fortuner	2017	11001	2021-02-09	s287sy
9	3	Duster	2015	76001	2021-04-09	d726dy
10	4	Sandero	2016	54826	2021-03-24	g872ud

\\.

```
--
-- TOC entry 2874 (class 0 OID 24577)
-- Dependencies: 197
-- Data for Name: driver; Type: TABLE DATA; Schema: taxi; Owner: postgres
--
```

```
COPY taxi.driver (driver_id, driver_name, driver_adress, driver_phone,
driver_passport, driver_position, driver_category) FROM stdin;
```

1	Ivanov Ivan Ivanovich	\\N	9786442334
	4566 234566	driver	B
2	Sidorov Ivan Sidorovich	\\N	9782753467
	4466 272377	driver	B
3	Radovich Mikhail Mikhailovich	\\N	9782590443
	4166 560810	driver	C
4	Gavrov Mikhail Victorovich	\\N	9787000483
	4166 341819	driver	B
5	Voronov Victor Petrovich	\\N	9793401148
	4156 413920	driver	B
6	Frunov Petor Victorovich	\\N	9794018816
	4156 1238765	driver	C

\\.


```
--
-- TOC entry 2877 (class 0 OID 24606)
-- Dependencies: 200
-- Data for Name: models; Type: TABLE DATA; Schema: taxi; Owner: postgres
--
```

```
COPY taxi.models (model_id, model_name, model_brand, tech_characteristics)
FROM stdin;
```

1	Solaris	Hyundai	5, auto, 1.4
2	Rio	Kia	5, mech, 1.6
3	Duster	Renault	5, auto, 1.6
4	Sandero	Renault	5, auto, 1.6
5	Fortuner	Toyota	5, auto, 2.7

```
\.
```

```
--
-- TOC entry 2880 (class 0 OID 24633)
-- Dependencies: 203
-- Data for Name: passenger; Type: TABLE DATA; Schema: taxi; Owner:
postgres
--
```

```
COPY taxi.passenger (passanger_id, passanger_name, passanger_phone) FROM
stdin;
```

1	Victorova Alina Antonovna	9129345921
2	Antonov Anton Antonovich	9219742476
3	Antonova Anita Antonovna	9212568105
4	Vernov Alexey Vladisavovich	9646295184
5	Danilova Elizaveta Victorovna	9985269140

```
\.
```

```
--
-- TOC entry 2878 (class 0 OID 24616)
-- Dependencies: 201
-- Data for Name: ride; Type: TABLE DATA; Schema: taxi; Owner: postgres
--
```

```
COPY taxi.ride (ride_id, car_id, call_worker_id, tarif_id, passanger_id, call_date,
time_begin, time_end, from_loc, to_loc, distance) FROM stdin;
```

1	1	1	3	2	2021-06-06	10:10:00	11:03:00	Lensoveta
23								Lomonosova 9
	10							
2	2	1	2	5	2021-06-07	16:10:00	17:03:00	
	Moskovskaya 21							Chkalova 9
	15							
3	2	1	2	4	2021-06-07	17:10:00	18:03:00	Chkalova 21
	Nevskiy 66						20	
4	2	1	2	3	2021-06-07	18:10:00	19:03:00	Nevskiy 86
	Chkalova 1						22	
5	1	1	3	2	2021-06-06	16:10:00	17:00:00	
	Lomonosova 9							Chkalova 18
	23							
6	1	1	3	2	2021-06-06	18:10:00	19:00:00	Ligovskiy
18								Lensoveta 23
	13							
7	1	1	3	1	2021-06-06	11:10:00	12:00:00	Nevskiy 18
	Ligovskiy 23						3	
8	5	2	1	1	2021-06-08	20:10:00	20:30:00	Nevskiy 88
	Bolshaya Morskaya 23						3	
9	5	2	1	3	2021-06-08	20:40:00	21:00:00	Bolshaya
	Morskaya 30							Moskovskiy prospect 100
	17							
10	5	2	1	4	2021-06-08	21:10:00	21:00:00	Altayskaya
18								Nevskiy 66
	20							
11	5	2	1	5	2021-06-08	21:30:00	22:00:00	Ligovskiy
33								Petrogradskaya 30
	11							

\.

--

-- TOC entry 2876 (class 0 OID 24591)

-- Dependencies: 199

-- Data for Name: schedule; Type: TABLE DATA; Schema: taxi; Owner: postgres

--

COPY taxi.schedule (shift_id, car_id, driver_id, shift_begin, shift_end) FROM stdin;

1	1	2	2021-06-06 08:05:00	2021-06-06 20:00:00
2	2	1	2021-06-07 16:05:00	2021-06-08 02:00:00
3	3	4	2021-06-07 08:05:00	2021-06-07 16:00:00
4	4	5	2021-06-08 09:00:00	2021-06-08 19:00:00

5 5 3 2021-06-08 20:00:00 2021-06-09 03:00:00

\\.

--

-- TOC entry 2881 (class 0 OID 24646)

-- Dependencies: 204

-- Data for Name: tarif; Type: TABLE DATA; Schema: taxi; Owner: postgres

--

COPY taxi.tarif (tarif_id, tarif_name, tarif_price) FROM stdin;

1	econom	90
2	business	150
3	lux	200

\\.

--

-- TOC entry 2737 (class 2606 OID 24630)

-- Name: call_worker call_worker_pkey; Type: CONSTRAINT; Schema: taxi;
Owner: postgres

--

ALTER TABLE ONLY taxi.call_worker

ADD CONSTRAINT call_worker_pkey PRIMARY KEY (call_worker_id);

--

-- TOC entry 2721 (class 2606 OID 24586)

-- Name: car car_id; Type: CONSTRAINT; Schema: taxi; Owner: postgres

--

ALTER TABLE ONLY taxi.car

ADD CONSTRAINT car_id PRIMARY KEY (car_id);

--

-- TOC entry 2713 (class 2606 OID 40995)

-- Name: schedule check_data_sch; Type: CHECK CONSTRAINT; Schema: taxi;
Owner: postgres

--

ALTER TABLE taxi.schedule

```
ADD CONSTRAINT check_data_sch CHECK ((shift_begin < shift_end)) NOT
VALID;
```

```
--
-- TOC entry 2714 (class 2606 OID 40968)
-- Name: ride distance_not_zero; Type: CHECK CONSTRAINT; Schema: taxi;
Owner: postgres
--
```

```
ALTER TABLE taxi.ride
ADD CONSTRAINT distance_not_zero CHECK ((distance > 0)) NOT VALID;
```

```
--
-- TOC entry 2717 (class 2606 OID 24581)
-- Name: driver driver_id; Type: CONSTRAINT; Schema: taxi; Owner: postgres
--
```

```
ALTER TABLE ONLY taxi.driver
ADD CONSTRAINT driver_id PRIMARY KEY (driver_id);
```

```
--
-- TOC entry 2712 (class 2606 OID 41001)
-- Name: car km_not_zero; Type: CHECK CONSTRAINT; Schema: taxi; Owner:
postgres
--
```

```
ALTER TABLE taxi.car
ADD CONSTRAINT km_not_zero CHECK ((km > 0)) NOT VALID;
```

```
--
-- TOC entry 2729 (class 2606 OID 24610)
-- Name: models models_pkey; Type: CONSTRAINT; Schema: taxi; Owner:
postgres
--
```

```
ALTER TABLE ONLY taxi.models
ADD CONSTRAINT models_pkey PRIMARY KEY (model_id);
```

```
--
```

-- TOC entry 2741 (class 2606 OID 24637)
-- Name: passenger passenger_pkey; Type: CONSTRAINT; Schema: taxi; Owner:
postgres
--

ALTER TABLE ONLY taxi.passenger
ADD CONSTRAINT passenger_pkey PRIMARY KEY (passanger_id);

--
-- TOC entry 2715 (class 2606 OID 40969)
-- Name: tarif price_not_zero; Type: CHECK CONSTRAINT; Schema: taxi;
Owner: postgres
--

ALTER TABLE taxi.tarif
ADD CONSTRAINT price_not_zero CHECK ((tarif_price > 0)) NOT VALID;

--
-- TOC entry 2733 (class 2606 OID 24620)
-- Name: ride ride_pkey; Type: CONSTRAINT; Schema: taxi; Owner: postgres
--

ALTER TABLE ONLY taxi.ride
ADD CONSTRAINT ride_pkey PRIMARY KEY (ride_id);

--
-- TOC entry 2725 (class 2606 OID 24595)
-- Name: schedule schedule_pkey; Type: CONSTRAINT; Schema: taxi; Owner:
postgres
--

ALTER TABLE ONLY taxi.schedule
ADD CONSTRAINT schedule_pkey PRIMARY KEY (shift_id);

--
-- TOC entry 2719 (class 2606 OID 24588)
-- Name: driver unique_cols; Type: CONSTRAINT; Schema: taxi; Owner:
postgres
--

```

ALTER TABLE ONLY taxi.driver
  ADD CONSTRAINT unique_cols UNIQUE (driver_id, driver_phone,
driver_passport);

--
-- TOC entry 2739 (class 2606 OID 24641)
-- Name: call_worker unique_cols_call_work; Type: CONSTRAINT; Schema:
taxi; Owner: postgres
--

ALTER TABLE ONLY taxi.call_worker
  ADD CONSTRAINT unique_cols_call_work UNIQUE (call_worker_id,
call_worker_phone, call_worker_passport);

--
-- TOC entry 2723 (class 2606 OID 40971)
-- Name: car unique_cols_cars; Type: CONSTRAINT; Schema: taxi; Owner:
postgres
--

ALTER TABLE ONLY taxi.car
  ADD CONSTRAINT unique_cols_cars UNIQUE (car_id, car_num);

--
-- TOC entry 2731 (class 2606 OID 24643)
-- Name: models unique_models; Type: CONSTRAINT; Schema: taxi; Owner:
postgres
--

ALTER TABLE ONLY taxi.models
  ADD CONSTRAINT unique_models UNIQUE (model_id);

--
-- TOC entry 2743 (class 2606 OID 24639)
-- Name: passenger unique_passangers; Type: CONSTRAINT; Schema: taxi;
Owner: postgres
--

ALTER TABLE ONLY taxi.passenger

```

```

    ADD CONSTRAINT unique_passangers UNIQUE (passanger_id,
passanger_phone);

--
-- TOC entry 2735 (class 2606 OID 24652)
-- Name: ride unique_rides; Type: CONSTRAINT; Schema: taxi; Owner: postgres
--

ALTER TABLE ONLY taxi.ride
    ADD CONSTRAINT unique_rides UNIQUE (ride_id);

--
-- TOC entry 2727 (class 2606 OID 24645)
-- Name: schedule unique_shifts; Type: CONSTRAINT; Schema: taxi; Owner:
postgres
--

ALTER TABLE ONLY taxi.schedule
    ADD CONSTRAINT unique_shifts UNIQUE (shift_id);

--
-- TOC entry 2745 (class 2606 OID 24650)
-- Name: tarif unique_tarifs; Type: CONSTRAINT; Schema: taxi; Owner: postgres
--

ALTER TABLE ONLY taxi.tarif
    ADD CONSTRAINT unique_tarifs PRIMARY KEY (tarif_id);

--
-- TOC entry 2750 (class 2606 OID 24653)
-- Name: ride call_worker; Type: FK CONSTRAINT; Schema: taxi; Owner:
postgres
--

ALTER TABLE ONLY taxi.ride
    ADD CONSTRAINT call_worker FOREIGN KEY (call_worker_id)
REFERENCES taxi.call_worker(call_worker_id) ON UPDATE RESTRICT ON
DELETE RESTRICT NOT VALID;

--

```

```
-- TOC entry 2747 (class 2606 OID 24596)
-- Name: schedule cars; Type: FK CONSTRAINT; Schema: taxi; Owner: postgres
--
```

```
ALTER TABLE ONLY taxi.schedule
  ADD CONSTRAINT cars FOREIGN KEY (car_id) REFERENCES
taxi.car(car_id) ON UPDATE RESTRICT ON DELETE RESTRICT NOT
VALID;
```

```
--
-- TOC entry 2749 (class 2606 OID 24621)
-- Name: ride cars; Type: FK CONSTRAINT; Schema: taxi; Owner: postgres
--
```

```
ALTER TABLE ONLY taxi.ride
  ADD CONSTRAINT cars FOREIGN KEY (car_id) REFERENCES
taxi.car(car_id) ON UPDATE RESTRICT ON DELETE RESTRICT;
```

```
--
-- TOC entry 2748 (class 2606 OID 24601)
-- Name: schedule drivers; Type: FK CONSTRAINT; Schema: taxi; Owner:
postgres
--
```

```
ALTER TABLE ONLY taxi.schedule
  ADD CONSTRAINT drivers FOREIGN KEY (driver_id) REFERENCES
taxi.driver(driver_id) ON UPDATE RESTRICT ON DELETE RESTRICT NOT
VALID;
```

```
--
-- TOC entry 2746 (class 2606 OID 24611)
-- Name: car model; Type: FK CONSTRAINT; Schema: taxi; Owner: postgres
--
```

```
ALTER TABLE ONLY taxi.car
  ADD CONSTRAINT model FOREIGN KEY (model_id) REFERENCES
taxi.models(model_id) ON UPDATE RESTRICT ON DELETE RESTRICT NOT
VALID;
```

```
--
-- TOC entry 2752 (class 2606 OID 24663)
```



```
-- Name: ride passenger; Type: FK CONSTRAINT; Schema: taxi; Owner: postgres
--
```

```
ALTER TABLE ONLY taxi.ride
```

```
  ADD CONSTRAINT passenger FOREIGN KEY (passanger_id)
REFERENCES taxi.passenger(passanger_id) ON UPDATE RESTRICT ON
DELETE RESTRICT NOT VALID;
```

```
--
```

```
-- TOC entry 2751 (class 2606 OID 24658)
```

```
-- Name: ride tariffs; Type: FK CONSTRAINT; Schema: taxi; Owner: postgres
```

```
--
```

```
ALTER TABLE ONLY taxi.ride
```

```
  ADD CONSTRAINT tariffs FOREIGN KEY (tarif_id) REFERENCES
taxi.tarif(tarif_id) ON UPDATE RESTRICT ON DELETE RESTRICT NOT
VALID;
```

```
-- Completed on 2021-06-22 16:18:02
```

```
--
```

```
-- PostgreSQL database dump complete
```

```
--
```

Вывод: в ходе работы работы изучен функционал PgAdmin 4, созданы БД, схема и таблицы, определены типы данных, ограничения, первичные и внешние ключи. В базу загружены данные, сделана резервная копия.