Министерство науки и высшего образования Российской Федерации
федеральное государственное автономное образовательное учреждение высшего образования
«НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ ИТМО»

Отчет

по лабораторной работе №3 «Создание таблиц базы данных PostgreSQL. Заполнение таблиц рабочими данными»

по дисциплине **«Проектирование и реализация баз данных»**

Автор: Волжева М. И.

Факультет: ИКТ

Группа: К3241

Преподаватель: Говорова М.М.

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Оглавление

Цель работы

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

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. (Создать две резервные копии: с расширением CUSTOM для восстановления БД; с расширением PLAIN для листинга (в отчете); при создании резервных копий БД настроить параметры Dump options для Type of objects и Queries.)
7. Восстановить БД.

Вариант 19. БД «Пассажир»

Описание предметной области:

Информационная система служит для продажи железнодорожных билетов. Билеты могут продаваться на текущие сутки или предварительно (не более чем за 45 суток). Цена билета при предварительной продаже снижается на 5%. Билет может быть приобретен в кассе или онлайн. Если билет приобретен в кассе, необходимо знать, в какой. Для каждой кассы известны номер и адрес. Кассы могут располагаться в различных населенных пунктах.

Поезда курсируют по расписанию, но могут назначаться дополнительные поезда на заданный период или определенные даты.

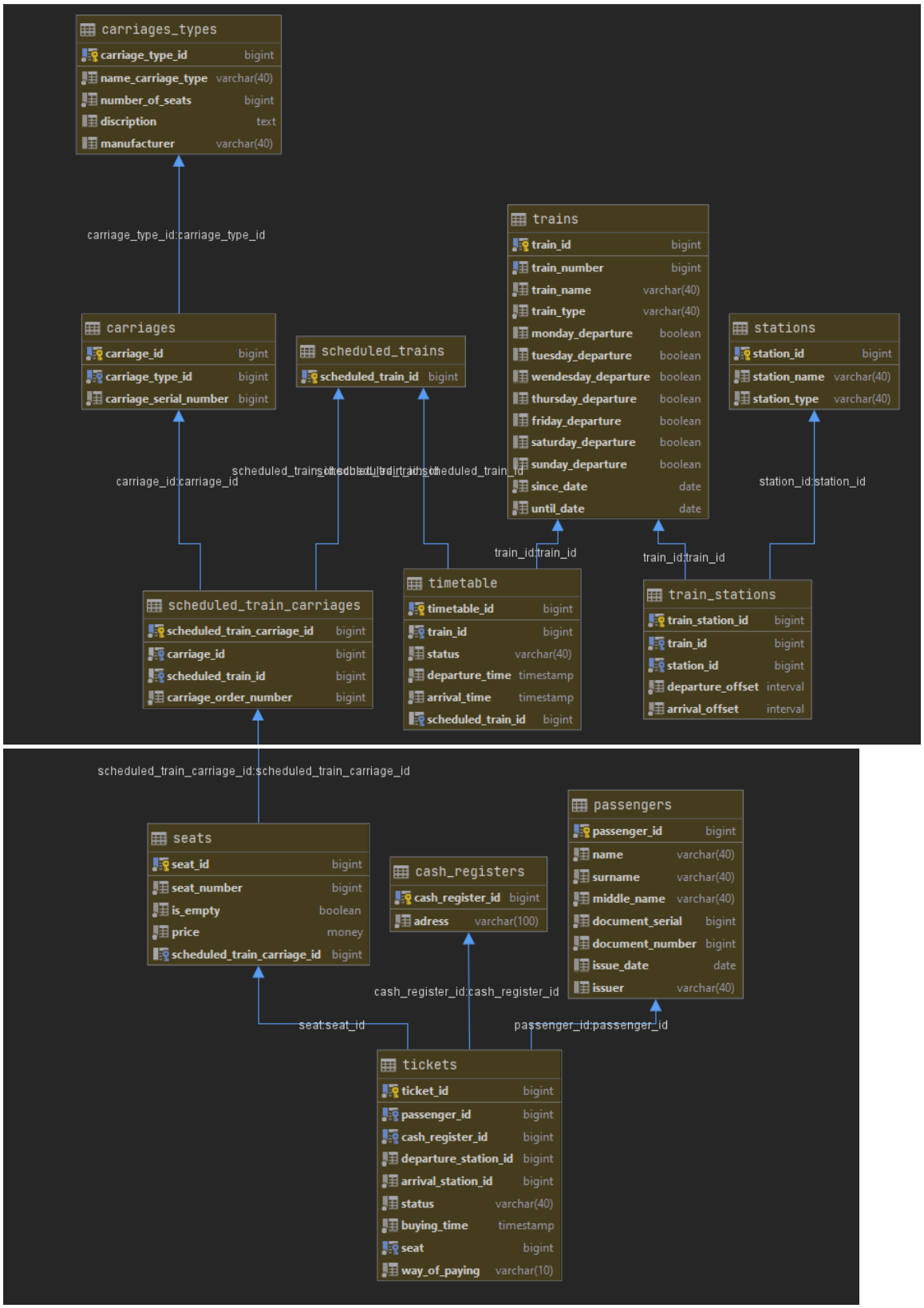
По всем промежуточным остановкам на маршруте известны название, тип населенного пункта, время прибытия, отправления, время стоянки.

Необходимо учитывать, что местом посадки и высадки пассажира могут быть промежуточные пункты по маршруту.

БД должна содержать следующий минимальный набор сведений: Номер поезда. Название поезда. Тип поезда. Пункт назначения. Пункт назначения для проданного билета. Номер вагона. Тип вагона. Количество мест в вагоне. Цена билета. Дата отправления. Дата прибытия. Дата прибытия для пункта назначения проданного билета. Время отправления. Номер вагона в поезде. Номер билета. Место. Тип места. Фамилия пассажира. Имя пассажира. Отчество пассажира. Паспортные данные.

Выполнение

Схема логической модели базы данных, сгенерированная в Generate ERD (в соответствии с лабораторной работой 2)



Скрипт резервной копии (plain):

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

-- Dumped from database version 14.9
-- Dumped by pg_dump version 14.9

-- Started on 2023-10-29 12:27:49

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 10 (class 2615 OID 16558)
-- Name: railways; Type: SCHEMA; Schema: -; Owner: postgres
--

CREATE SCHEMA railways;


ALTER SCHEMA railways OWNER TO postgres;
```

```
SET default_tablespace = '';

SET default_table_access_method = heap;

--
-- TOC entry 233 (class 1259 OID 16574)
-- Name: carriages; Type: TABLE; Schema: railways; Owner: postgres
--

CREATE TABLE railways.carriages (
    carriage_id bigint NOT NULL,
    carriage_type_id bigint NOT NULL,
    carriage_serial_number bigint NOT NULL,
    CONSTRAINT carriage_number_0_check CHECK ((carriage_serial_number > 0))
);


ALTER TABLE railways.carriages OWNER TO postgres;

--
-- TOC entry 234 (class 1259 OID 16579)
-- Name: carriages_types; Type: TABLE; Schema: railways; Owner: postgres
--

CREATE TABLE railways.carriages_types (
    carriage_type_id bigint NOT NULL,
    name_carriage_type character varying(40) NOT NULL,
    number_of_seats bigint NOT NULL,
    discription text,
    manufacturer character varying(40),
```

```
    CONSTRAINT name_carriage_type_check CHECK (((name_carriage_type)::text = ANY
((ARRAY['seat'::character varying, 'econom_class'::character varying, 'first_class'::character
varying, 'business_class'::character varying])::text[]))),
    CONSTRAINT number_of_seats_0_check CHECK ((number_of_seats > 0))
);



ALTER TABLE railways.carriages_types OWNER TO postgres;

--
-- TOC entry 239 (class 1259 OID 16607)
-- Name: cash_registers; Type: TABLE; Schema: railways; Owner: postgres
--

CREATE TABLE railways.cash_registers (
    cash_register_id bigint NOT NULL,
    adress character varying(100) NOT NULL
);



ALTER TABLE railways.cash_registers OWNER TO postgres;

--
-- TOC entry 237 (class 1259 OID 16597)
-- Name: passengers; Type: TABLE; Schema: railways; Owner: postgres
--

CREATE TABLE railways.passengers (
    passenger_id bigint NOT NULL,
    name character varying(40) NOT NULL,
    surname character varying(40) NOT NULL,
```

```
    middle_name character varying(40) NOT NULL,
    document_serial bigint NOT NULL,
    document_number bigint NOT NULL,
    issue_date date,
    issuer character varying(40),
    CONSTRAINT document_number_check CHECK ((document_number > 0)),
    CONSTRAINT document_serial_check CHECK ((document_serial > 0))
);


ALTER TABLE railways.passengers OWNER TO postgres;

--
-- TOC entry 241 (class 1259 OID 16758)
-- Name: scheduled_train_carriages; Type: TABLE; Schema: railways; Owner: postgres
--

CREATE TABLE railways.scheduled_train_carriages (
    scheduled_train_carriage_id bigint NOT NULL,
    carriage_id bigint NOT NULL,
    scheduled_train_id bigint NOT NULL,
    carriage_order_number bigint NOT NULL
);


ALTER TABLE railways.scheduled_train_carriages OWNER TO postgres;

--
-- TOC entry 230 (class 1259 OID 16559)
-- Name: scheduled_trains; Type: TABLE; Schema: railways; Owner: postgres
```

```
--

CREATE TABLE railways.scheduled_trains (
    scheduled_train_id bigint NOT NULL
);


ALTER TABLE railways.scheduled_trains OWNER TO postgres;

--
-- TOC entry 232 (class 1259 OID 16569)
-- Name: seats; Type: TABLE; Schema: railways; Owner: postgres
--

CREATE TABLE railways.seats (
    seat_id bigint NOT NULL,
    seat_number bigint NOT NULL,
    is_empty boolean DEFAULT true NOT NULL,
    price money NOT NULL,
    scheduled_train_carriage_id bigint,
    CONSTRAINT seat_number_0_check CHECK ((seat_number > 0))
);


ALTER TABLE railways.seats OWNER TO postgres;

--
-- TOC entry 231 (class 1259 OID 16564)
-- Name: stations; Type: TABLE; Schema: railways; Owner: postgres
--
```

```
CREATE TABLE railways.stations (
    station_id bigint NOT NULL,
    station_name character varying(40) NOT NULL,
    station_type character varying(40) NOT NULL
);


ALTER TABLE railways.stations OWNER TO postgres;


--
-- TOC entry 238 (class 1259 OID 16602)
-- Name: tickets; Type: TABLE; Schema: railways; Owner: postgres
--

CREATE TABLE railways.tickets (
    ticket_id bigint NOT NULL,
    passenger_id bigint NOT NULL,
    cash_register_id bigint NOT NULL,
    departure_station_id bigint NOT NULL,
    arrival_station_id bigint NOT NULL,
    status character varying(40) NOT NULL,
    buying_time timestamp without time zone NOT NULL,
    seat bigint NOT NULL,
    way_of_paying character varying(10) NOT NULL,
    CONSTRAINT ticket_status_check CHECK (((status)::text = ANY
((ARRAY['reserved'::character varying, 'returned'::character varying, 'sold'::character
varying])::text[])))
);
```

```
ALTER TABLE railways.tickets OWNER TO postgres;

--
-- TOC entry 240 (class 1259 OID 16612)
-- Name: timetable; Type: TABLE; Schema: railways; Owner: postgres
--

CREATE TABLE railways.timetable (
    timetable_id bigint NOT NULL,
    train_id bigint NOT NULL,
    status character varying(40) NOT NULL,
    departure_time timestamp without time zone NOT NULL,
    arrival_time timestamp without time zone NOT NULL,
    scheduled_train_id bigint
);


ALTER TABLE railways.timetable OWNER TO postgres;

--
-- TOC entry 235 (class 1259 OID 16587)
-- Name: train_stations; Type: TABLE; Schema: railways; Owner: postgres
--

CREATE TABLE railways.train_stations (
    train_station_id bigint NOT NULL,
    train_id bigint NOT NULL,
    station_id bigint NOT NULL,
    departure_offset interval NOT NULL,
    arrival_offset interval NOT NULL,
```

```
    CONSTRAINT departure_offset_arrival_offset_check CHECK ((departure_offset >=
arrival_offset))
);



ALTER TABLE railways.train_stations OWNER TO postgres;


--
-- TOC entry 236 (class 1259 OID 16592)
-- Name: trains; Type: TABLE; Schema: railways; Owner: postgres
--


CREATE TABLE railways.trains (
    train_id bigint NOT NULL,
    train_number bigint NOT NULL,
    train_name character varying(40) NOT NULL,
    train_type character varying(40) NOT NULL,
    monday_departure boolean,
    tuesday_departure boolean,
    wendesday_departure boolean,
    thursday_departure boolean,
    friday_departure boolean,
    saturday_departure boolean,
    sunday_departure boolean,
    since_date date NOT NULL,
    until_date date NOT NULL,
    CONSTRAINT since_date_and_until_date_check CHECK ((since_date < until_date)),
    CONSTRAINT train_number_0_check CHECK ((train_number > 0)),
    CONSTRAINT train_type_check CHECK (((train_type)::text = ANY
((ARRAY['suburban'::character varying, 'high_speed'::character varying,
'long_distance'::character varying])::text[])))
);
```

```
ALTER TABLE railways.trains OWNER TO postgres;


--
-- TOC entry 3450 (class 0 OID 16574)
-- Dependencies: 233
-- Data for Name: carriages; Type: TABLE DATA; Schema: railways; Owner: postgres
--


COPY railways.carriages (carriage_id, carriage_type_id, carriage_serial_number) FROM stdin;
0	5	1
1	5	2
2	5	3
3	4	4
4	4	5
5	3	1001
6	3	1002
7	3	1003
8	0	1004
9	0	1005
10	1	1006
11	1	1007
12	2	1008
13	4	6
14	4	7
\.


--
```

-- TOC entry 3451 (class 0 OID 16579)

-- Dependencies: 234

-- Data for Name: carriages_types; Type: TABLE DATA; Schema: railways; Owner: postgres

--

COPY railways.carriages_types (carriage_type_id, name_carriage_type, number_of_seats, discription, manufacturer) FROM stdin;

0	econom_class	20	\N	a

1	first_class	18	\N	a

2	business_class	16	\N	a

3	seat	40	\N	b

4	seat	40	\N	b

5	seat	40	\N	b

\.

--

-- TOC entry 3456 (class 0 OID 16607)

-- Dependencies: 239

-- Data for Name: cash_registers; Type: TABLE DATA; Schema: railways; Owner: postgres

--

COPY railways.cash_registers (cash_register_id, adress) FROM stdin;

0	Adler\n

1	Spb

4	Sochi

3	Kazan

2	Moscow

5	online

\.

--

-- TOC entry 3454 (class 0 OID 16597)

-- Dependencies: 237

-- Data for Name: passengers; Type: TABLE DATA; Schema: railways; Owner: postgres

--

COPY railways.passengers (passenger_id, name, surname, middle_name, document_serial, document_number, issue_date, issuer) FROM stdin;

0 Mariia Volzheva Ilinichna 4018 1 2020-05-05 MVD

1 Tamara Ushnichkova Andreevna 4022 1 2023-01-26 MVD

2 Aleksandra Kulikova Vladimirovna 4019 2 2021-09-09 MVD

3 Viktoria DrankoNikolaevna 4019 3 2020-08-09 MVD\n

4 Mariia Koturanova Sergeevna 4019 4 2020-08-09 MVD

5 Karina Krasuk Aleksandrovna 4018 5 2020-02-02 MVD

6 Rudolf Pupkin Tagirivich 1111 111111 1111-11-11 DVD

\.

--

-- TOC entry 3458 (class 0 OID 16758)

-- Dependencies: 241

-- Data for Name: scheduled_train_carriages; Type: TABLE DATA; Schema: railways; Owner: postgres

--

COPY railways.scheduled_train_carriages (scheduled_train_carriage_id, carriage_id, scheduled_train_id, carriage_order_number) FROM stdin;

0 14 0 1

1 13 1 1

2 4 2 1

3 3 3 1

4 2 4 1

5 1 5 1

6 0 6 1

7 5 7 1

8 6 8 1

9 7 9 1

10 8 10 1

11 9 11 1

12 10 12 1

13 11 13 1

\.

--

-- TOC entry 3447 (class 0 OID 16559)

-- Dependencies: 230

-- Data for Name: scheduled_trains; Type: TABLE DATA; Schema: railways; Owner: postgres

--

COPY railways.scheduled_trains (scheduled_train_id) FROM stdin;

0

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

\.

--

-- TOC entry 3449 (class 0 OID 16569)

-- Dependencies: 232

-- Data for Name: seats; Type: TABLE DATA; Schema: railways; Owner: postgres

--

COPY railways.seats (seat_id, seat_number, is_empty, price, scheduled_train_carriage_id) FROM stdin;

0 1 f 5 000,00 ? 1

1 2 t 5 000,00 ? 1

2 3 f 5 000,00 ? 1

3 4 t 5 000,00 ? 1

4 5 t 5 000,00 ? 1

5 6 t 5 000,00 ? 1

\.

--

-- TOC entry 3448 (class 0 OID 16564)

-- Dependencies: 231

-- Data for Name: stations; Type: TABLE DATA; Schema: railways; Owner: postgres

--

```
COPY railways.stations (station_id, station_name, station_type) FROM stdin;
4	Москва	город
3	Бологое	город
2	Вышний Волочёк	город
1	Тверь	город
0	Санкт-Петербург	город
8	Зеленогорск	посёлок городского типа\n
7	Выборг	город
6	Великий Новгород	город
5	Псков	город
9	Рощино	посёлок городского типа
10	Горьковское	посёлок
\.



--
-- TOC entry 3455 (class 0 OID 16602)
-- Dependencies: 238
-- Data for Name: tickets; Type: TABLE DATA; Schema: railways; Owner: postgres
--

COPY railways.tickets (ticket_id, passenger_id, cash_register_id, departure_station_id,
arrival_station_id, status, buying_time, seat, way_of_paying) FROM stdin;
0	1	5	0	7	sold	2023-10-27 22:27:48.879036	1	online
1	6	5	0	7	sold	2023-10-27 22:27:48.879036	3	online
\.



--
-- TOC entry 3457 (class 0 OID 16612)
```

-- Dependencies: 240

-- Data for Name: timetable; Type: TABLE DATA; Schema: railways; Owner: postgres

--

COPY railways.timetable (timetable_id, train_id, status, departure_time, arrival_time, scheduled_train_id) FROM stdin;

1 2 departured 2003-01-08 09:05:06 2003-01-08 13:05:06 \N

0 1 departured 2003-01-08 04:05:06 2003-01-08 08:05:00 \N

2 1 departured 2023-10-30 04:05:06 2003-10-28 08:05:00 \N

3 1 scheduled 2023-10-31 04:05:06 2003-01-29 08:05:00 \N

4 2 scheduled 2023-10-30 09:05:06 2003-10-28 13:05:00 \N

5 2 scheduled 2023-10-31 09:05:06 2023-10-29 13:05:00 \N

6 3 scheduled 2023-10-30 09:05:06 2023-10-30 10:35:06 \N

7 4 scheduled 2023-10-30 11:05:06 2023-10-30 12:35:06 \N

8 5 scheduled 2023-10-30 09:05:06 2023-10-30 12:05:06 \N

9 6 scheduled\n 2023-10-30 12:15:06 2023-10-30 15:15:06 \N

10 7 scheduled 2023-10-31 09:05:06 2023-10-31 12:05:06 \N

11 8 scheduled 2023-10-31 13:05:06 2023-10-31 16:05:06 \N

12 9 scheduled 2023-10-30 04:05:06 2023-10-31 10:05:06 \N

13 10 scheduled 2023-10-31 17:05:06 2023-10-30 23:05:06 \N

\.

--

-- TOC entry 3452 (class 0 OID 16587)

-- Dependencies: 235

-- Data for Name: train_stations; Type: TABLE DATA; Schema: railways; Owner: postgres

--

COPY railways.train_stations (train_station_id, train_id, station_id, departure_offset, arrival_offset) FROM stdin;

3	1	0	00:00:00	00:00:00
5	2	4	00:00:00	00:00:00
10	3	0	00:00:00	00:00:00
14	4	7	00:00:00	00:00:00
2	1	1	03:02:00	03:00:00
4	1	4	04:01:00	04:00:00
1	1	2	02:02:00	02:00:00
0	1	3	01:02:00	01:00:00
6	2	1	01:02:00	01:00:00
7	2	2	02:02:00	02:00:00
8	2	3	03:02:00	03:00:00
9	2	0	04:02:00	04:00:00
11	3	8	00:25:00	00:24:00
12	3	9	00:35:00	00:34:00
13	3	7	01:30:00	01:30:00
15	4	9	00:25:00	00:24:00
16	4	8	00:35:00	00:34:00
17	4	0	01:30:00	01:30:00
18	5	0	00:00:00	00:00:00
19	5	8	42:00:00	41:00:00
20	5	9	52:00:00	51:00:00
21	5	10	62:00:00	61:00:00
22	5	7	182:00:00	181:00:00
23	6	7	00:00:00	00:00:00
24	6	10	42:00:00	41:00:00
25	6	9	52:00:00	51:00:00
26	6	8	62:00:00	60:00:00
27	6	0	182:00:00	181:00:00
28	7	0	00:00:00	00:00:00
29	7	6	180:00:00	180:00:00

30 8 6 00:00:00 00:00:00

31 8 0 180:00:00 180:00:00

32 9 0 00:00:00 00:00:00

33 9 5 06:00:00 06:00:00

34 10 5 00:00:00 00:00:00

35 10 0 06:00:00 06:00:00

\.

--

-- TOC entry 3453 (class 0 OID 16592)

-- Dependencies: 236

-- Data for Name: trains; Type: TABLE DATA; Schema: railways; Owner: postgres

--

COPY railways.trains (train_id, train_number, train_name, train_type, monday_departure, tuesday_departure, wendesday_departure, thursday_departure, friday_departure, saturday_departure, sunday_departure, since_date, until_date) FROM stdin;

1 1001 Sapsan (Spb - Moscow) high_speed t t t t t t t 2000-01-01 2100-01-01

2 1002 Sapsan (Moscow-Spb) high_speed t t t t t t t 2000-01-01 2100-01-01

3 1003 Lastochka (Spb-Vyborg) high_speed t \N t \N t t t 2000-01-01 2100-01-01

4 1004 Lastochka (Vyborg-Spb) high_speed \N t \N t \N t t 2000-01-01 2100-01-01

5 1005 Sbp-Vyborg suburban t t t t t t t 2000-01-01 2100-01-01

6 1006 Vyborg-Spb suburban t t t t t t t 2000-01-01 2100-01-01

7 1007 Spb-VelikyNovgorod long_distance \N t t \N t t t 2000-01-01 2100-01-01

8 1008 VelikyNovgorod-Spb long_distance \N t t \N t t t 2000-01-01 2100-01-01

9 1009 Spb-Pskov long_distance t \N \N t \N t t 2000-01-01 2100-01-01

10 1010 Pskov-Spb long_distance t \N \N t \N t t 2000-01-01 2100-01-01

\.

--

-- TOC entry 3271 (class 2606 OID 16578)

-- Name: carriages carriages_pkey; Type: CONSTRAINT; Schema: railways; Owner: postgres

--

ALTER TABLE ONLY railways.carriages

ADD CONSTRAINT carriages_pkey PRIMARY KEY (carriage_id);

--

-- TOC entry 3274 (class 2606 OID 16585)

-- Name: carriages_types carriages_types_pkey; Type: CONSTRAINT; Schema: railways; Owner: postgres

--

ALTER TABLE ONLY railways.carriages_types

ADD CONSTRAINT carriages_types_pkey PRIMARY KEY (carriage_type_id);

--

-- TOC entry 3291 (class 2606 OID 16611)

-- Name: cash_registers cash_registers_pkey; Type: CONSTRAINT; Schema: railways; Owner: postgres

--

```
ALTER TABLE ONLY railways.cash_registers
    ADD CONSTRAINT cash_registers_pkey PRIMARY KEY (cash_register_id);


--
-- TOC entry 3284 (class 2606 OID 16601)
-- Name: passengers passengers_pkey; Type: CONSTRAINT; Schema: railways; Owner: postgres
--

ALTER TABLE ONLY railways.passengers
    ADD CONSTRAINT passengers_pkey PRIMARY KEY (passenger_id);


--
-- TOC entry 3295 (class 2606 OID 16762)
-- Name: scheduled_train_carriages scheduled_train_carriages_pkey; Type: CONSTRAINT; Schema: railways; Owner: postgres
--

ALTER TABLE ONLY railways.scheduled_train_carriages
    ADD CONSTRAINT scheduled_train_carriages_pkey PRIMARY KEY (scheduled_train_carriage_id);


--
-- TOC entry 3265 (class 2606 OID 16563)
-- Name: scheduled_trains scheduled_train_pkey; Type: CONSTRAINT; Schema: railways; Owner: postgres
--

ALTER TABLE ONLY railways.scheduled_trains
```

```
    ADD CONSTRAINT scheduled_train_pkey PRIMARY KEY (scheduled_train_id);


--
-- TOC entry 3269 (class 2606 OID 16573)
-- Name: seats seats_pkey; Type: CONSTRAINT; Schema: railways; Owner: postgres
--

ALTER TABLE ONLY railways.seats
    ADD CONSTRAINT seats_pkey PRIMARY KEY (seat_id);


--
-- TOC entry 3267 (class 2606 OID 16568)
-- Name: stations stations_pkey; Type: CONSTRAINT; Schema: railways; Owner: postgres
--

ALTER TABLE ONLY railways.stations
    ADD CONSTRAINT stations_pkey PRIMARY KEY (station_id);


--
-- TOC entry 3263 (class 2606 OID 16742)
-- Name: timetable status_check; Type: CHECK CONSTRAINT; Schema: railways; Owner: postgres
--

ALTER TABLE railways.timetable
    ADD CONSTRAINT status_check CHECK (((status)::text = ANY (ARRAY[('scheduled'::character varying)::text, ('canceled'::character varying)::text, ('departured'::character varying)::text]))) NOT VALID;
```

```
--
-- TOC entry 3289 (class 2606 OID 16606)
-- Name: tickets tickets_pkey; Type: CONSTRAINT; Schema: railways; Owner: postgres
--

ALTER TABLE ONLY railways.tickets
    ADD CONSTRAINT tickets_pkey PRIMARY KEY (ticket_id);


--
-- TOC entry 3293 (class 2606 OID 16616)
-- Name: timetable timetable_pkey; Type: CONSTRAINT; Schema: railways; Owner: postgres
--

ALTER TABLE ONLY railways.timetable
    ADD CONSTRAINT timetable_pkey PRIMARY KEY (timetable_id);


--
-- TOC entry 3280 (class 2606 OID 16699)
-- Name: trains train_number; Type: CONSTRAINT; Schema: railways; Owner: postgres
--

ALTER TABLE ONLY railways.trains
    ADD CONSTRAINT train_number UNIQUE (train_number);


--
-- TOC entry 3278 (class 2606 OID 16591)
```

```
-- Name: train_stations train_stations_pkey; Type: CONSTRAINT; Schema: railways; Owner: postgres

--


ALTER TABLE ONLY railways.train_stations

    ADD CONSTRAINT train_stations_pkey PRIMARY KEY (train_station_id);




--

-- TOC entry 3282 (class 2606 OID 16596)

-- Name: trains trains_pkey; Type: CONSTRAINT; Schema: railways; Owner: postgres

--


ALTER TABLE ONLY railways.trains

    ADD CONSTRAINT trains_pkey PRIMARY KEY (train_id);




--

-- TOC entry 3262 (class 2606 OID 16741)

-- Name: tickets way_of_paying_ckeck; Type: CHECK CONSTRAINT; Schema: railways; Owner: postgres

--


ALTER TABLE railways.tickets

    ADD CONSTRAINT way_of_paying_ckeck CHECK (((way_of_paying)::text = ANY ((ARRAY['online'::character varying, 'ofline'::character varying])::text[]))) NOT VALID;




--

-- TOC entry 3272 (class 1259 OID 16622)

-- Name: fki_carriage_type_id_fk; Type: INDEX; Schema: railways; Owner: postgres

--
```

```
CREATE INDEX fki_carriage_type_id_fk ON railways.carriages USING btree
(carriage_type_id);



--

-- TOC entry 3285 (class 1259 OID 16685)

-- Name: fki_cash_register_id_fk; Type: INDEX; Schema: railways; Owner: postgres

--

CREATE INDEX fki_cash_register_id_fk ON railways.tickets USING btree (cash_register_id);



--

-- TOC entry 3286 (class 1259 OID 16673)

-- Name: fki_passenger_id_fk; Type: INDEX; Schema: railways; Owner: postgres

--

CREATE INDEX fki_passenger_id_fk ON railways.tickets USING btree (passenger_id);



--

-- TOC entry 3287 (class 1259 OID 16679)

-- Name: fki_seat_id_fk; Type: INDEX; Schema: railways; Owner: postgres

--

CREATE INDEX fki_seat_id_fk ON railways.tickets USING btree (seat);



--

-- TOC entry 3275 (class 1259 OID 16651)
```

-- Name: fki_station_id_fk; Type: INDEX; Schema: railways; Owner: postgres

--

CREATE INDEX fki_station_id_fk ON railways.train_stations USING btree (station_id);

--

-- TOC entry 3276 (class 1259 OID 16645)

-- Name: fki_train_id_fk; Type: INDEX; Schema: railways; Owner: postgres

--

CREATE INDEX fki_train_id_fk ON railways.train_stations USING btree (train_id);

--

-- TOC entry 3305 (class 2606 OID 16763)

-- Name: scheduled_train_carriages carriage_id_fk; Type: FK CONSTRAINT; Schema: railways; Owner: postgres

--

ALTER TABLE ONLY railways.scheduled_train_carriages

    ADD CONSTRAINT carriage_id_fk FOREIGN KEY (carriage_id) REFERENCES railways.carriages(carriage_id) NOT VALID;

--

-- TOC entry 3297 (class 2606 OID 16629)

-- Name: carriages carriage_type_id_fk; Type: FK CONSTRAINT; Schema: railways; Owner: postgres

--

ALTER TABLE ONLY railways.carriages

```
    ADD CONSTRAINT carriage_type_id_fk FOREIGN KEY (carriage_type_id)
REFERENCES railways.carriages_types(carriage_type_id);



--

-- TOC entry 3302 (class 2606 OID 16680)

-- Name: tickets cash_register_id_fk; Type: FK CONSTRAINT; Schema: railways; Owner:
postgres

--


ALTER TABLE ONLY railways.tickets

    ADD CONSTRAINT cash_register_id_fk FOREIGN KEY (cash_register_id) REFERENCES
railways.cash_registers(cash_register_id);



--

-- TOC entry 3300 (class 2606 OID 16668)

-- Name: tickets passenger_id_fk; Type: FK CONSTRAINT; Schema: railways; Owner: postgres

--


ALTER TABLE ONLY railways.tickets

    ADD CONSTRAINT passenger_id_fk FOREIGN KEY (passenger_id) REFERENCES
railways.passengers(passenger_id);



--

-- TOC entry 3296 (class 2606 OID 16778)

-- Name: seats scheduled_train_carriage_id_fk; Type: FK CONSTRAINT; Schema: railways;
Owner: postgres

--


ALTER TABLE ONLY railways.seats
```

```
    ADD CONSTRAINT scheduled_train_carriage_id_fk FOREIGN KEY
(scheduled_train_carriage_id) REFERENCES
railways.scheduled_train_carriages(scheduled_train_carriage_id) NOT VALID;



--

-- TOC entry 3306 (class 2606 OID 16768)

-- Name: scheduled_train_carriages scheduled_train_id_fk; Type: FK CONSTRAINT; Schema:
railways; Owner: postgres

--


ALTER TABLE ONLY railways.scheduled_train_carriages

    ADD CONSTRAINT scheduled_train_id_fk FOREIGN KEY (scheduled_train_id)
REFERENCES railways.scheduled_trains(scheduled_train_id) NOT VALID;



--

-- TOC entry 3304 (class 2606 OID 16773)

-- Name: timetable scheduled_train_id_fk; Type: FK CONSTRAINT; Schema: railways; Owner:
postgres

--


ALTER TABLE ONLY railways.timetable

    ADD CONSTRAINT scheduled_train_id_fk FOREIGN KEY (scheduled_train_id)
REFERENCES railways.scheduled_trains(scheduled_train_id) NOT VALID;



--

-- TOC entry 3301 (class 2606 OID 16674)

-- Name: tickets seat_id_fk; Type: FK CONSTRAINT; Schema: railways; Owner: postgres

--


ALTER TABLE ONLY railways.tickets
```

```
    ADD CONSTRAINT seat_id_fk FOREIGN KEY (seat) REFERENCES
railways.seats(seat_id);



--

-- TOC entry 3299 (class 2606 OID 16646)

-- Name: train_stations station_id_fk; Type: FK CONSTRAINT; Schema: railways; Owner:
postgres

--


ALTER TABLE ONLY railways.train_stations

    ADD CONSTRAINT station_id_fk FOREIGN KEY (station_id) REFERENCES
railways.stations(station_id);



--

-- TOC entry 3298 (class 2606 OID 16640)

-- Name: train_stations train_id_fk; Type: FK CONSTRAINT; Schema: railways; Owner:
postgres

--


ALTER TABLE ONLY railways.train_stations

    ADD CONSTRAINT train_id_fk FOREIGN KEY (train_id) REFERENCES
railways.trains(train_id);



--

-- TOC entry 3303 (class 2606 OID 16657)

-- Name: timetable train_id_fk; Type: FK CONSTRAINT; Schema: railways; Owner: postgres

--


ALTER TABLE ONLY railways.timetable
```

```
    ADD CONSTRAINT train_id_fk FOREIGN KEY (train_id) REFERENCES
railways.trains(train_id);



--

-- TOC entry 3446 (class 0 OID 16569)

-- Dependencies: 232

-- Name: seats; Type: ROW SECURITY; Schema: railways; Owner: postgres

--


ALTER TABLE railways.seats ENABLE ROW LEVEL SECURITY;


-- Completed on 2023-10-29 12:27:50


--

-- PostgreSQL database dump complete

--
```

Вывод

В данной лабораторной работе я овладела практическими навыками создания таблиц базы данных PostgreSQL 1X, заполнения их рабочими данными, резервного копирования и восстановления БД. Так же я устанавливала ограничения в таблицах: Primary Key, Unique, Check, Foreign Key. Познакомилась с Query Tool и утилитами pg_Dump, pg_Restore.