**Отчет**

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

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

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**ИТМО**

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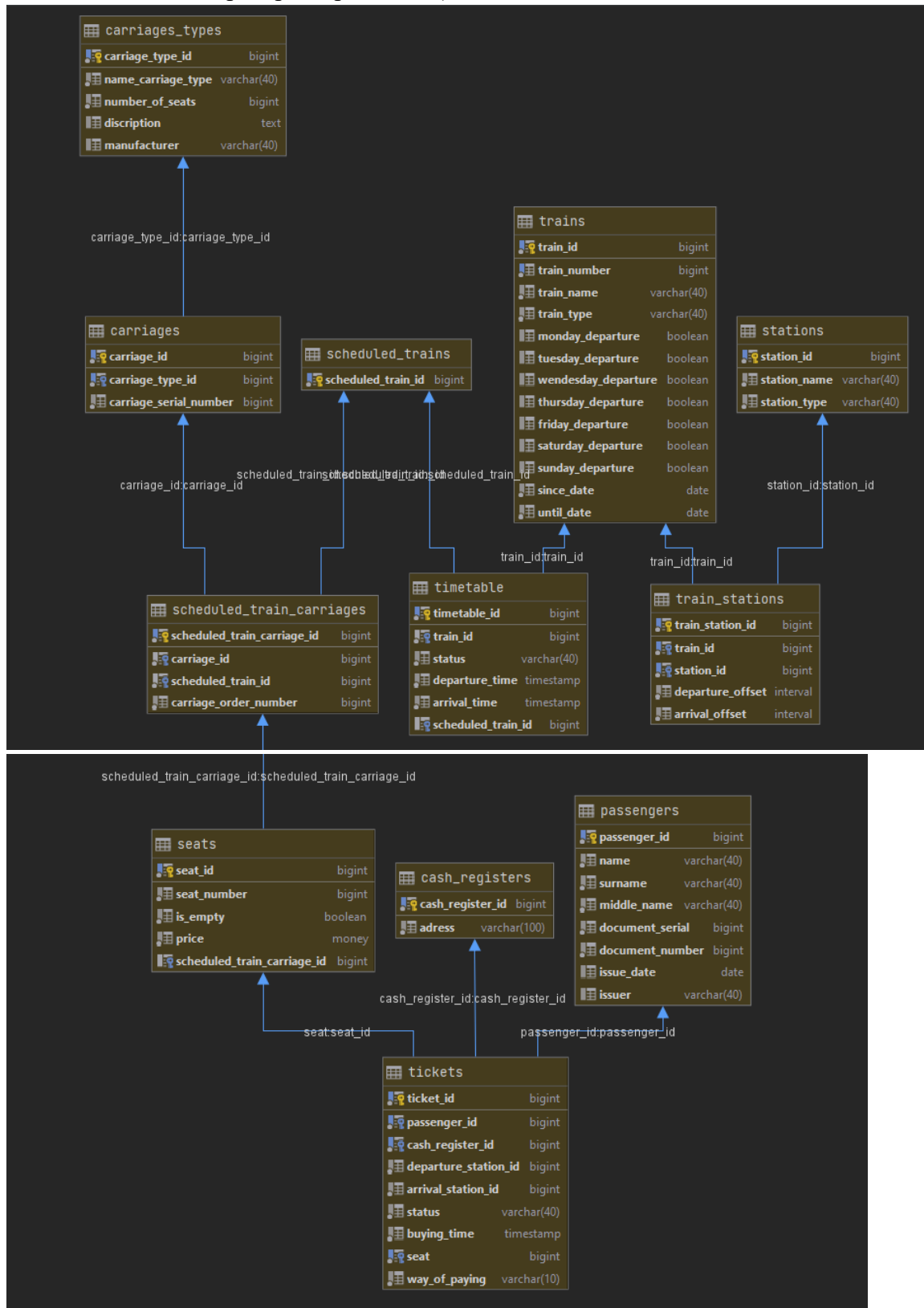
По всем промежуточным остановкам на маршруте известны название, тип населенного пункта, время прибытия, отправления, время стоянки.

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 2023-11-10 17:08:44


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 3544 (class 1262 OID 13754)

-- Name: postgres; Type: DATABASE; Schema: -; Owner: postgres

--


CREATE DATABASE postgres WITH TEMPLATE = template0 ENCODING = 'UTF8'
LOCALE = 'Russian_Russia.1251';

```sql
ALTER DATABASE postgres OWNER TO postgres;


\connect postgres


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 3545 (class 0 OID 0)

-- Dependencies: 3544

-- Name: DATABASE postgres; Type: COMMENT; Schema: -; Owner: postgres

--


COMMENT ON DATABASE postgres IS 'default administrative connection database';


--
-- TOC entry 8 (class 2615 OID 16394)

-- Name: pgagent; Type: SCHEMA; Schema: -; Owner: postgres
```

--

CREATE SCHEMA pgagent;

ALTER SCHEMA pgagent OWNER TO postgres;

--

-- TOC entry 3546 (class 0 OID 0)

-- Dependencies: 8

-- Name: SCHEMA pgagent; Type: COMMENT; Schema: -; Owner: postgres

--

COMMENT ON SCHEMA pgagent IS 'pgAgent system tables';

--

-- TOC entry 10 (class 2615 OID 16558)

-- Name: railways; Type: SCHEMA; Schema: -; Owner: postgres

--

CREATE SCHEMA railways;

ALTER SCHEMA railways OWNER TO postgres;

--

-- TOC entry 2 (class 3079 OID 16384)

-- Name: adminpack; Type: EXTENSION; Schema: -; Owner: -

--

CREATE EXTENSION IF NOT EXISTS adminpack WITH SCHEMA pg_catalog;

--

-- TOC entry 3547 (class 0 OID 0)

-- Dependencies: 2

-- Name: EXTENSION adminpack; Type: COMMENT; Schema: -; Owner:

--

COMMENT ON EXTENSION adminpack IS 'administrative functions for PostgreSQL';

--

-- TOC entry 3 (class 3079 OID 16395)

-- Name: pgagent; Type: EXTENSION; Schema: -; Owner: -

--

CREATE EXTENSION IF NOT EXISTS pgagent WITH SCHEMA pgagent;

--

-- TOC entry 3548 (class 0 OID 0)

-- Dependencies: 3

-- Name: EXTENSION pgagent; Type: COMMENT; Schema: -; Owner:

--

COMMENT ON EXTENSION pgagent IS 'A PostgreSQL job scheduler';

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
--

```sql
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;



--
```

-- Name: passengers; Type: TABLE; Schema: railways; Owner: postgres

--

```sql
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,
```

```sql
    price money NOT NULL,

    scheduled_train_carriage_id bigint,

    CONSTRAINT seat_number_0_check CHECK ((seat_number > 0))

);
```

```sql
ALTER TABLE railways.seats OWNER TO postgres;
```

```sql
--

-- TOC entry 231 (class 1259 OID 16564)

-- Name: stations; Type: TABLE; Schema: railways; Owner: postgres

--
```

```sql
CREATE TABLE railways.stations (

    station_id bigint NOT NULL,

    station_name character varying(40) NOT NULL,

    station_type character varying(40) NOT NULL

);
```

```sql
ALTER TABLE railways.stations OWNER TO postgres;
```

```sql
--

-- TOC entry 238 (class 1259 OID 16602)

-- Name: tickets; Type: TABLE; Schema: railways; Owner: postgres

--
```

```sql
CREATE TABLE railways.tickets (
```

```sql
    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

--

```sql
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

--
```

```sql
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 3258 (class 0 OID 16396)

-- Dependencies: 215

-- Data for Name: pga_jobagent; Type: TABLE DATA; Schema: pgagent; Owner: postgres

--
```

COPY pgagent.pga_jobagent (jagpid, jaglogintime, jagstation) FROM stdin;

8596    2023-11-09 03:58:16.129202+03       Mary-Laptop

\.

--

-- TOC entry 3259 (class 0 OID 16405)

-- Dependencies: 217

-- Data for Name: pga_jobclass; Type: TABLE DATA; Schema: pgagent; Owner: postgres

--

COPY pgagent.pga_jobclass (jclid, jclname) FROM stdin;

\.

--

-- TOC entry 3260 (class 0 OID 16415)

-- Dependencies: 219

-- Data for Name: pga_job; Type: TABLE DATA; Schema: pgagent; Owner: postgres

--

COPY pgagent.pga_job (jobid, jobjclid, jobname, jobdesc, jobhostagent, jobenabled, jobcreated, jobchanged, jobagentid, jobnextrun, joblastrun) FROM stdin;

\.

--

-- TOC entry 3262 (class 0 OID 16463)

-- Dependencies: 223

-- Data for Name: pga_schedule; Type: TABLE DATA; Schema: pgagent; Owner: postgres

--


COPY pgagent.pga_schedule (jscid, jscjobid, jscname, jscdesc, jscenabled, jscstart, jscend, jscminutes, jschours, jscweekdays, jscmonthdays, jscmonths) FROM stdin;

\.



--

-- TOC entry 3263 (class 0 OID 16491)

-- Dependencies: 225

-- Data for Name: pga_exception; Type: TABLE DATA; Schema: pgagent; Owner: postgres

--


COPY pgagent.pga_exception (jexid, jexscid, jexdate, jextime) FROM stdin;

\.



--

-- TOC entry 3264 (class 0 OID 16505)

-- Dependencies: 227

-- Data for Name: pga_joblog; Type: TABLE DATA; Schema: pgagent; Owner: postgres

--


COPY pgagent.pga_joblog (jlgid, jlgjobid, jlgstatus, jlgstart, jlgduration) FROM stdin;

\.

--

-- TOC entry 3261 (class 0 OID 16439)

-- Dependencies: 221

-- Data for Name: pga_jobstep; Type: TABLE DATA; Schema: pgagent; Owner: postgres

--

COPY pgagent.pga_jobstep (jstid, jstjobid, jstname, jstdesc, jstenabled, jstkind, jstcode, jstconnstr, jstdbname, jstonerror, jscnextrun) FROM stdin;

\.

--

-- TOC entry 3265 (class 0 OID 16521)

-- Dependencies: 229

-- Data for Name: pga_jobsteplog; Type: TABLE DATA; Schema: pgagent; Owner: postgres

--

COPY pgagent.pga_jobsteplog (jslid, jsljlgid, jsljstid, jslstatus, jslresult, jslstart, jslduration, jsloutput) FROM stdin;

\.

--

-- TOC entry 3530 (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 3531 (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 3536 (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 3534 (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 3538 (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 3527 (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 3529 (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 3528 (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 3535 (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 3537 (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 3532 (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 3533 (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 3351 (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 3354 (class 2606 OID 16585)

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

--

```sql
ALTER TABLE ONLY railways.carriages_types
    ADD CONSTRAINT carriages_types_pkey PRIMARY KEY (carriage_type_id);
```

--

-- TOC entry 3371 (class 2606 OID 16611)

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

--

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

--

-- TOC entry 3364 (class 2606 OID 16601)

-- Name: passengers passengers_pkey; Type: CONSTRAINT; Schema: railways; Owner: postgres

--

```sql
ALTER TABLE ONLY railways.passengers
```

ADD CONSTRAINT passengers_pkey PRIMARY KEY (passenger_id);

--

-- TOC entry 3375 (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 3345 (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 3349 (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 3347 (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 3320 (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 3369 (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 3373 (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 3360 (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 3358 (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 3362 (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 3319 (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 3352 (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 3365 (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 3366 (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 3367 (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 3355 (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 3356 (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 3385 (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 3377 (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 3382 (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 3380 (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 3376 (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 3386 (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 3384 (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 3381 (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 3379 (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 3378 (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 3383 (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 3526 (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 2023-11-10 17:08:45

--

-- 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.