

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:
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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.

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.

Указание:

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 .

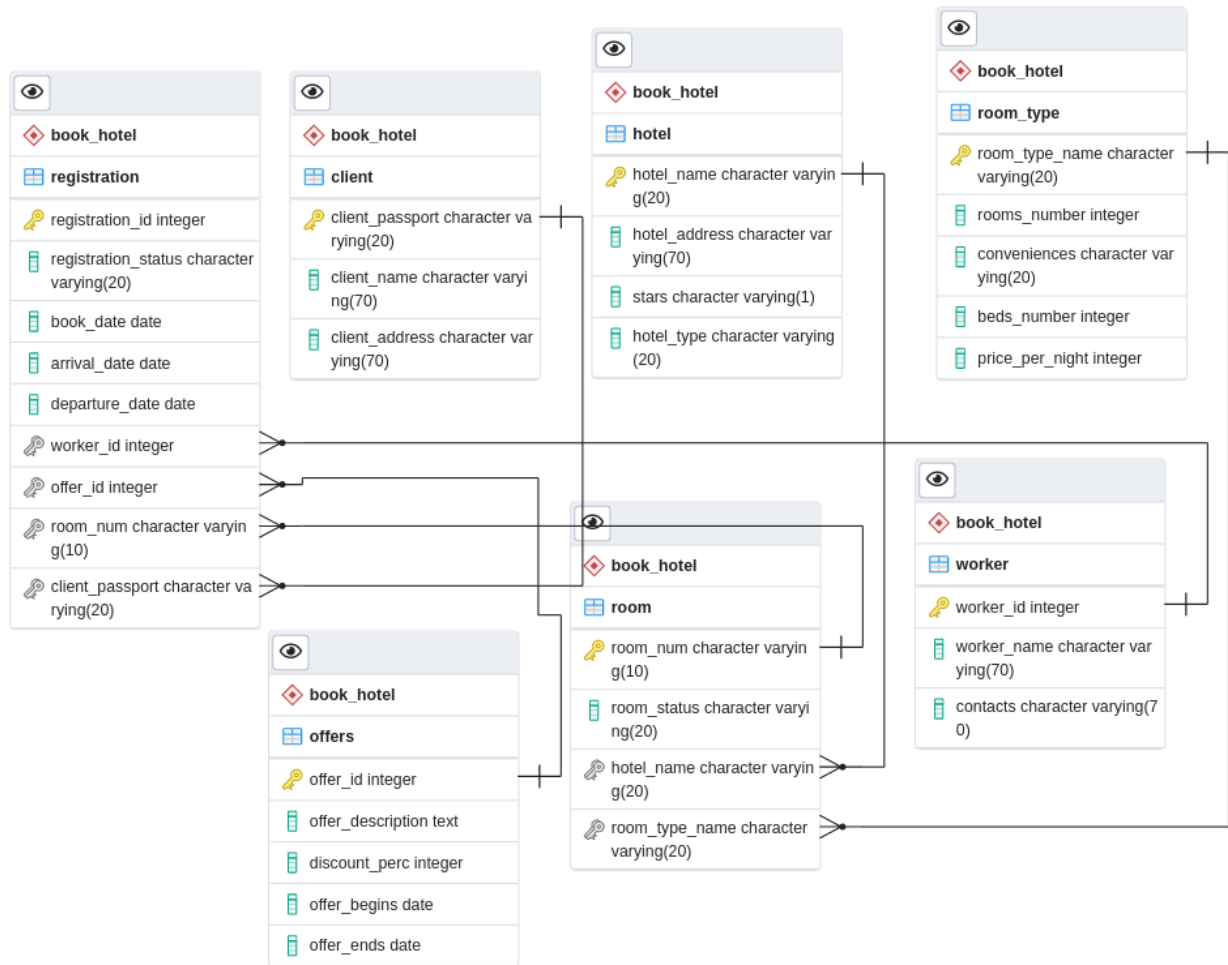
7. Восстановить БД.

ВЫПОЛНЕНИЕ

1. Наименование БД

“hotel”

2. Схема логической модели базы данных, сгенерированная в Generate ERD



3. Dump, содержащий скрипты работы с БД.

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

-- Dumped from database version 13.2 (Ubuntu 13.2-1.pgdg20.04+1)
-- Dumped by pg_dump version 13.2 (Ubuntu 13.2-1.pgdg20.04+1)

-- Started on 2021-04-23 18:25:45 MSK

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 5 (class 2615 OID 17059)
-- Name: book_hotel; Type: SCHEMA; Schema: -; Owner: postgres
--

/*Создание соответствующей схемы*/

CREATE SCHEMA book_hotel;
```

```

ALTER SCHEMA book_hotel OWNER TO postgres;

SET default_tablespace = "";

SET default_table_access_method = heap;

--
-- TOC entry 200 (class 1259 OID 17060)
-- Name: client; Type: TABLE; Schema: book_hotel; Owner: postgres
--

/*Создание таблицы клиентов*/

CREATE TABLE book_hotel.client (
    client_passport character varying(20) NOT NULL,
    client_name character varying(70) NOT NULL,
    client_address character varying(70) NOT NULL
);

ALTER TABLE book_hotel.client OWNER TO postgres;

--
-- TOC entry 201 (class 1259 OID 17065)
-- Name: hotel; Type: TABLE; Schema: book_hotel; Owner: postgres
--

/*Создание таблицы отелей*/

```

```

CREATE TABLE book_hotel.hotel (
    hotel_name character varying(20) NOT NULL,
    hotel_address character varying(70) NOT NULL,
    stars character varying(1) NOT NULL,
    hotel_type character varying(20) NOT NULL,
    CONSTRAINT stars_valid CHECK (((stars)::text = ANY
(ARRAY[('1'::character varying)::text, ('2'::character varying)::text,
('3'::character varying)::text, ('4'::character varying)::text, ('5'::character
varying)::text])))
);

```

```

ALTER TABLE book_hotel.hotel OWNER TO postgres;

```

```

--
-- TOC entry 203 (class 1259 OID 17076)
-- Name: offers; Type: TABLE; Schema: book_hotel; Owner: postgres
--

```

```

/*Создание таблицы акций*/

```

```

CREATE TABLE book_hotel.offers (
    offer_id integer NOT NULL,
    offer_description text NOT NULL,
    discount_perc integer NOT NULL,
    offer_begins date NOT NULL,
    offer_ends date NOT NULL,
    CONSTRAINT discount_perc_valid CHECK (((discount_perc > 0) AND
(discount_perc <= 100))),

```

```
        CONSTRAINT offer_begins_valid CHECK ((offer_begins <=
offer_ends)),
    CONSTRAINT offer_ends_valid CHECK ((offer_ends >= offer_begins)),
    CONSTRAINT offer_id_valid CHECK ((offer_id > 0))
);
```

```
ALTER TABLE book_hotel.offers OWNER TO postgres;
```

```
--
-- TOC entry 202 (class 1259 OID 17074)
-- Name: offers_offer_id_seq; Type: SEQUENCE; Schema: book_hotel;
Owner: postgres
--
```

```
CREATE SEQUENCE book_hotel.offers_offer_id_seq
    AS integer
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    NO MAXVALUE
    CACHE 1;
```

```
ALTER TABLE book_hotel.offers_offer_id_seq OWNER TO postgres;
```

```
--
-- TOC entry 3069 (class 0 OID 0)
-- Dependencies: 202
```

```
-- Name: offers_offer_id_seq; Type: SEQUENCE OWNED BY; Schema:  
book_hotel; Owner: postgres
```

```
--
```

```
ALTER SEQUENCE book_hotel.offers_offer_id_seq OWNED BY  
book_hotel.offers.offer_id;
```

```
--
```

```
-- TOC entry 209 (class 1259 OID 17156)
```

```
-- Name: registration; Type: TABLE; Schema: book_hotel; Owner: postgres
```

```
--
```

```
/*Создание таблицы регистрации*/
```

```
CREATE TABLE book_hotel.registration (  
    registration_id integer NOT NULL,  
    registration_status character varying(50) NOT NULL,  
    book_date date NOT NULL,  
    arrival_date date NOT NULL,  
    departure_date date NOT NULL,  
    worker_id integer NOT NULL,  
    offer_id integer,  
    room_num character varying(10) NOT NULL,  
    client_passport character varying(20) NOT NULL,  
    CONSTRAINT arr_date_valid CHECK (((arrival_date >= book_date)  
AND (arrival_date < departure_date))),  
    CONSTRAINT book_date_valid CHECK (((book_date <= arrival_date)  
AND (book_date < departure_date))),
```



```

CONSTRAINT dep_date_valid CHECK (((departure_date > arrival_date)
AND (departure_date > book_date))),
CONSTRAINT reg_status_valid CHECK (((registration_status)::text =
ANY (ARRAY[('бронирование подтверждено'::character varying)::text,
('номер оплачен'::character varying)::text, ('клиент заехал'::character
varying)::text, ('клиент выехал'::character varying)::text])),
CONSTRAINT registration_id_valid CHECK ((registration_id > 0))
);

```

```

ALTER TABLE book_hotel.registration OWNER TO postgres;

```

```

--
-- TOC entry 208 (class 1259 OID 17154)
-- Name: registration_registration_id_seq; Type: SEQUENCE; Schema:
book_hotel; Owner: postgres
--

```

```

CREATE SEQUENCE book_hotel.registration_registration_id_seq
AS integer
START WITH 1
INCREMENT BY 1
NO MINVALUE
NO MAXVALUE
CACHE 1;

```

```

ALTER TABLE book_hotel.registration_registration_id_seq OWNER TO
postgres;

```

```
--
-- TOC entry 3070 (class 0 OID 0)
-- Dependencies: 208
-- Name: registration_registration_id_seq; Type: SEQUENCE OWNED BY;
Schema: book_hotel; Owner: postgres
--
```

```
ALTER SEQUENCE book_hotel.registration_registration_id_seq OWNED
BY book_hotel.registration_registration_id;
```

```
--
-- TOC entry 207 (class 1259 OID 17105)
-- Name: room; Type: TABLE; Schema: book_hotel; Owner: postgres
--
```

```
/*Создание таблицы номеров*/
```

```
CREATE TABLE book_hotel.room (
    room_num character varying(10) NOT NULL,
    room_status character varying(20) NOT NULL,
    hotel_name character varying(20) NOT NULL,
    room_type_name character varying(20) NOT NULL,
    CONSTRAINT room_status_valid CHECK (((room_status)::text = ANY
(ARRAY[('занят'::character varying)::text, ('забронирован'::character
varying)::text, ('свободен'::character varying)::text])))
);
```

```
ALTER TABLE book_hotel.room OWNER TO postgres;
```

```
--  
-- TOC entry 206 (class 1259 OID 17097)  
-- Name: room_type; Type: TABLE; Schema: book_hotel; Owner: postgres  
--
```

```
/*Создание таблицы типов комнат*/
```

```
CREATE TABLE book_hotel.room_type (  
    room_type_name character varying(20) NOT NULL,  
    rooms_number integer NOT NULL,  
    conveniences character varying(70) NOT NULL,  
    beds_number integer NOT NULL,  
    price_per_night integer NOT NULL,  
    CONSTRAINT beds_number_valid CHECK (((beds_number > 0) AND  
(beds_number < 11))),  
    CONSTRAINT price_valid CHECK ((price_per_night > 0)),  
    CONSTRAINT rooms_number_valid CHECK (((rooms_number > 0)  
AND (rooms_number < 11)))  
);
```

```
ALTER TABLE book_hotel.room_type OWNER TO postgres;
```

```
--  
-- TOC entry 205 (class 1259 OID 17091)  
-- Name: worker; Type: TABLE; Schema: book_hotel; Owner: postgres  
--
```

```
/*Создание таблицы сотрудников*/
```

```
CREATE TABLE book_hotel.worker (  
    worker_id integer NOT NULL,  
    worker_name character varying(70) NOT NULL,  
    contacts character varying(70) NOT NULL,  
    CONSTRAINT worker_id_valid CHECK ((worker_id > 0))  
);
```

```
ALTER TABLE book_hotel.worker OWNER TO postgres;
```

```
--  
-- TOC entry 204 (class 1259 OID 17089)  
-- Name: worker_worker_id_seq; Type: SEQUENCE; Schema: book_hotel;  
Owner: postgres  
--
```

```
ALTER TABLE book_hotel.worker ALTER COLUMN worker_id ADD  
GENERATED ALWAYS AS IDENTITY (  
    SEQUENCE NAME book_hotel.worker_worker_id_seq  
    START WITH 1  
    INCREMENT BY 1  
    NO MINVALUE  
    NO MAXVALUE  
    CACHE 1  
);
```

```
--  
-- TOC entry 2888 (class 2604 OID 17079)
```

```
-- Name: offers offer_id; Type: DEFAULT; Schema: book_hotel; Owner:
postgres
```

```
--
```

```
ALTER TABLE ONLY book_hotel.offers ALTER COLUMN offer_id SET
DEFAULT nextval('book_hotel.offers_offer_id_seq'::regclass);
```

```
--
```

```
-- TOC entry 2898 (class 2604 OID 17159)
```

```
-- Name: registration registration_id; Type: DEFAULT; Schema: book_hotel;
Owner: postgres
```

```
--
```

```
ALTER TABLE ONLY book_hotel.registration ALTER COLUMN
registration_id SET DEFAULT
nextval('book_hotel.registration_registration_id_seq'::regclass);
```

```
--
```

```
-- TOC entry 3054 (class 0 OID 17060)
```

```
-- Dependencies: 200
```

```
-- Data for Name: client; Type: TABLE DATA; Schema: book_hotel;
Owner: postgres
```

```
--
```

```
/*Загрузка данных*/
```

```
COPY book_hotel.client (client_passport, client_name, client_address)
FROM stdin;
```

11 11 111111 Птицын Андрей Юрьевич г. Торжок, ул. Пирогова,
д.5

12 34 567891 Кошкин Иван Павловичг. Кострома, ул. Кузнецова,
д.10

\\.

--

-- TOC entry 3055 (class 0 OID 17065)

-- Dependencies: 201

-- Data for Name: hotel; Type: TABLE DATA; Schema: book_hotel; Owner:
postgres

--

COPY book_hotel.hotel (hotel_name, hotel_address, stars, hotel_type)
FROM stdin;

Вязьма Вяземский пер., д. 5-7 5 апартаменты

Альпийка ул. Альпийская, д. 1 4 отель-курорт

\\.

--

-- TOC entry 3057 (class 0 OID 17076)

-- Dependencies: 203

-- Data for Name: offers; Type: TABLE DATA; Schema: book_hotel;
Owner: postgres

--

COPY book_hotel.offers (offer_id, offer_description, discount_perc,
offer_begins, offer_ends) FROM stdin;

13 Всем молодоженам скидка 5% 5 2021-01-01 2021-12-31
14 Всем студентам в период летних каникул скидка 10%!10
2021-01-06 2021-01-09

\.

--

-- TOC entry 3063 (class 0 OID 17156)

-- Dependencies: 209

-- Data for Name: registration; Type: TABLE DATA; Schema: book_hotel;
Owner: postgres

--

COPY book_hotel.registration (registration_id, registration_status,
book_date, arrival_date, departure_date, worker_id, offer_id, room_num,
client_passport) FROM stdin;

1 клиент заехал 2021-10-08 2021-11-08 2021-12-08 14 \N
2 11 11 111111

2 бронирование подтверждено 2021-09-09 2021-10-12 2021-11-12
14 \N 34 12 34 567891

\.

--

-- TOC entry 3061 (class 0 OID 17105)

-- Dependencies: 207

-- Data for Name: room; Type: TABLE DATA; Schema: book_hotel; Owner:
postgres

--

```
COPY    book_hotel.room    (room_num,    room_status,    hotel_name,
room_type_name) FROM stdin;
```

```
2      занят Вязьма      полулюкс
```

```
34     забронирован     Альпийка    люкс
```

```
\.
```

```
--
```

```
-- TOC entry 3060 (class 0 OID 17097)
```

```
-- Dependencies: 206
```

```
-- Data for Name: room_type; Type: TABLE DATA; Schema: book_hotel;
Owner: postgres
```

```
--
```

```
COPY    book_hotel.room_type    (room_type_name,    rooms_number,
conveniences, beds_number, price_per_night) FROM stdin;
```

```
полулюкс  1      уборка, сейф, прачечная      2      7000
```

```
люкс  3      доставка питания, мини-бар, wi-fi  3      10000
```

```
\.
```

```
--
```

```
-- TOC entry 3059 (class 0 OID 17091)
```

```
-- Dependencies: 205
```

```
-- Data for Name: worker; Type: TABLE DATA; Schema: book_hotel;
Owner: postgres
```

```
--
```

```
COPY    book_hotel.worker    (worker_id,    worker_name,    contacts) FROM
stdin;
```


13 Васильев Артем Иванович +79211234567
14 Анисимова Дарья Владимировна +79219288888
\\.

--
-- TOC entry 3071 (class 0 OID 0)
-- Dependencies: 202
-- Name: offers_offer_id_seq; Type: SEQUENCE SET; Schema:
book_hotel; Owner: postgres
--

SELECT pg_catalog.setval('book_hotel.offers_offer_id_seq', 14, true);

--
-- TOC entry 3072 (class 0 OID 0)
-- Dependencies: 208
-- Name: registration_registration_id_seq; Type: SEQUENCE SET; Schema:
book_hotel; Owner: postgres
--

SELECT pg_catalog.setval('book_hotel.registration_registration_id_seq', 2,
true);

--
-- TOC entry 3073 (class 0 OID 0)
-- Dependencies: 204

```
-- Name: worker_worker_id_seq; Type: SEQUENCE SET; Schema:  
book_hotel; Owner: postgres
```

```
--
```

```
SELECT pg_catalog.setval('book_hotel.worker_worker_id_seq', 14, true);
```

```
--
```

```
-- TOC entry 2905 (class 2606 OID 17064)
```

```
-- Name: client_client_pkey; Type: CONSTRAINT; Schema: book_hotel;  
Owner: postgres
```

```
--
```

```
/*Первичные и внешние ключи*/
```

```
ALTER TABLE ONLY book_hotel.client
```

```
ADD CONSTRAINT client_pkey PRIMARY KEY (client_passport);
```

```
--
```

```
-- TOC entry 2907 (class 2606 OID 17070)
```

```
-- Name: hotel_hotel_pkey; Type: CONSTRAINT; Schema: book_hotel;  
Owner: postgres
```

```
--
```

```
ALTER TABLE ONLY book_hotel.hotel
```

```
ADD CONSTRAINT hotel_pkey PRIMARY KEY (hotel_name);
```

```
--
```

```
-- TOC entry 2909 (class 2606 OID 17088)
-- Name: offers offers_pkey; Type: CONSTRAINT; Schema: book_hotel;
Owner: postgres
```

```
--
```

```
ALTER TABLE ONLY book_hotel.offers
    ADD CONSTRAINT offers_pkey PRIMARY KEY (offer_id);
```

```
--
```

```
-- TOC entry 2917 (class 2606 OID 17166)
-- Name: registration registration_pkey; Type: CONSTRAINT; Schema:
book_hotel; Owner: postgres
```

```
--
```

```
ALTER TABLE ONLY book_hotel.registration
    ADD CONSTRAINT registration_pkey PRIMARY KEY
(registration_id);
```

```
--
```

```
-- TOC entry 2915 (class 2606 OID 17110)
-- Name: room room_pkey; Type: CONSTRAINT; Schema: book_hotel;
Owner: postgres
```

```
--
```

```
ALTER TABLE ONLY book_hotel.room
    ADD CONSTRAINT room_pkey PRIMARY KEY (room_num);
```

```
--  
-- TOC entry 2913 (class 2606 OID 17104)  
-- Name: room_type room_type_pkey; Type: CONSTRAINT; Schema:  
book_hotel; Owner: postgres
```

```
--
```

```
ALTER TABLE ONLY book_hotel.room_type  
    ADD CONSTRAINT room_type_pkey PRIMARY KEY  
(room_type_name);
```

```
--  
-- TOC entry 2911 (class 2606 OID 17096)  
-- Name: worker worker_pkey; Type: CONSTRAINT; Schema: book_hotel;  
Owner: postgres
```

```
--
```

```
ALTER TABLE ONLY book_hotel.worker  
    ADD CONSTRAINT worker_pkey PRIMARY KEY (worker_id);
```

```
--  
-- TOC entry 2920 (class 2606 OID 17167)  
-- Name: registration registration_client_passport_fkey; Type: FK  
CONSTRAINT; Schema: book_hotel; Owner: postgres
```

```
--
```

```
ALTER TABLE ONLY book_hotel.registration  
    ADD CONSTRAINT registration_client_passport_fkey FOREIGN KEY  
(client_passport) REFERENCES book_hotel.client(client_passport);
```

```
--  
-- TOC entry 2921 (class 2606 OID 17172)  
-- Name: registration_registration_offer_id_fkey; Type: FK CONSTRAINT;  
Schema: book_hotel; Owner: postgres  
--
```

```
ALTER TABLE ONLY book_hotel.registration  
    ADD CONSTRAINT registration_offer_id_fkey FOREIGN KEY  
(offer_id) REFERENCES book_hotel.offers(offer_id);
```

```
--  
-- TOC entry 2922 (class 2606 OID 17177)  
-- Name: registration_registration_room_num_fkey; Type: FK  
CONSTRAINT; Schema: book_hotel; Owner: postgres  
--
```

```
ALTER TABLE ONLY book_hotel.registration  
    ADD CONSTRAINT registration_room_num_fkey FOREIGN KEY  
(room_num) REFERENCES book_hotel.room(room_num);
```

```
--  
-- TOC entry 2923 (class 2606 OID 17182)  
-- Name: registration_registration_worker_id_fkey; Type: FK  
CONSTRAINT; Schema: book_hotel; Owner: postgres  
--
```

```
ALTER TABLE ONLY book_hotel.registration
    ADD CONSTRAINT registration_worker_id_fkey FOREIGN KEY
(worker_id) REFERENCES book_hotel.worker(worker_id);
```

```
--
-- TOC entry 2918 (class 2606 OID 17111)
-- Name: room room_hotel_name_fkey; Type: FK CONSTRAINT; Schema:
book_hotel; Owner: postgres
```

```
--
ALTER TABLE ONLY book_hotel.room
    ADD CONSTRAINT room_hotel_name_fkey FOREIGN KEY
(hotel_name) REFERENCES book_hotel.hotel(hotel_name);
```

```
--
-- TOC entry 2919 (class 2606 OID 17116)
-- Name: room room_room_type_name_fkey; Type: FK CONSTRAINT;
Schema: book_hotel; Owner: postgres
```

```
--
ALTER TABLE ONLY book_hotel.room
    ADD CONSTRAINT room_room_type_name_fkey FOREIGN KEY
(room_type_name) REFERENCES
book_hotel.room_type(room_type_name);
```

```
-- Completed on 2021-04-23 18:25:46 MSK
```

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

ВЫВОДЫ

В ходе проделанной работы была создана база данных, схема и таблицы, определены типы данных, ограничения, первичные и внешние ключи. В базу загружены данные. Сделана резервная копия базы данных в текстовом виде и в виде архива, также реализовано восстановление базы.