Министерство науки и высшего образования Российской Федерации

федеральное государственное автономное образовательное учреждение высшего образования

«НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ ИТМО»

О Т Ч Е Т

по лабораторной работе

«Создание БД PostgreSQL в pgAdmin. Резервное копирование и восстановление БД»

по дисциплине «Проектирование и реализация баз данных»

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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.
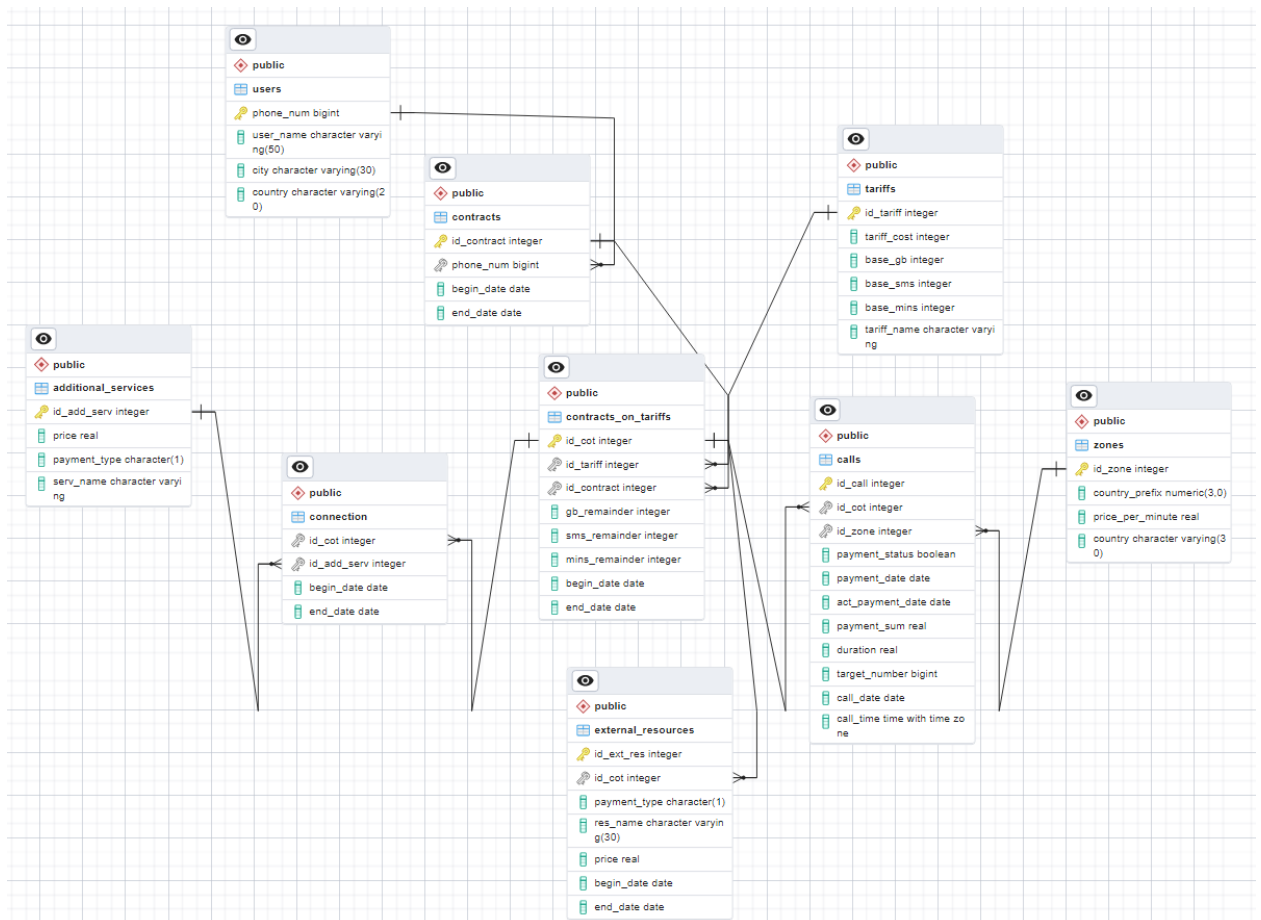
Указание:

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:

Наименование БД: mobile_provider

Схема логической модели:

Dump:

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

-- Dumped from database version 14.7
-- Dumped by pg_dump version 14.7

-- Started on 2023-04-16 14:57:42

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;

SET default_tablespace = '';
```

```sql
SET default_table_access_method = heap;

--
-- TOC entry 224 (class 1259 OID 16596)
-- Name: additional_services; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.additional_services (
    id_add_serv integer NOT NULL,
    price real NOT NULL,
    payment_type character(1) NOT NULL, --d/w/m/1 по дням/по неделям/по
месяцам/единоразово
    serv_name character varying NOT NULL,
    CONSTRAINT additional_services_price_check CHECK ((price > (0)::double
precision)) --положительная цена
);


ALTER TABLE public.additional_services OWNER TO postgres;

--
-- TOC entry 223 (class 1259 OID 16595)
-- Name: additional_services_id_add_serv_seq; Type: SEQUENCE; Schema: public;
Owner: postgres
--

ALTER TABLE public.additional_services ALTER COLUMN id_add_serv ADD GENERATED
ALWAYS AS IDENTITY (
    SEQUENCE NAME public.additional_services_id_add_serv_seq --id генерируется
автоматически
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    MAXVALUE 1000
    CACHE 1
);



--
-- TOC entry 220 (class 1259 OID 16554)
-- Name: calls; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.calls (
    id_call integer NOT NULL,
    id_cot integer NOT NULL,
    id_zone integer NOT NULL,
    payment_status boolean NOT NULL,
    payment_date date,
    act_payment_date date,
```

```sql
    payment_sum real,
    duration real NOT NULL,
    target_number bigint NOT NULL,
    call_date date NOT NULL,
    call_time time with time zone NOT NULL,
    CONSTRAINT "21st century dates" CHECK ((payment_date > '2000-01-01'::date)),
--даты после 2000
    CONSTRAINT "21st century dates for calls" CHECK ((call_date > '2000-01-
01'::date)), --даты после 2000
    CONSTRAINT "positive duration" CHECK ((duration > (0)::double precision)), --
положительная длительность
    CONSTRAINT "positive target number" CHECK ((target_number > 0)) --
положительный номер адресата
);


ALTER TABLE public.calls OWNER TO postgres;

--
-- TOC entry 219 (class 1259 OID 16553)
-- Name: calls_id_call_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--

ALTER TABLE public.calls ALTER COLUMN id_call ADD GENERATED ALWAYS AS IDENTITY (
--id генерируется автоматически
    SEQUENCE NAME public.calls_id_call_seq
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    MAXVALUE 10000000
    CACHE 1
);



--
-- TOC entry 225 (class 1259 OID 16606)
-- Name: connection; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.connection (
    id_cot integer NOT NULL,
    id_add_serv integer NOT NULL,
    begin_date date NOT NULL,
    end_date date NOT NULL,
    CONSTRAINT connection_begin_date_check CHECK ((begin_date > '2000-01-
01'::date)), --даты после 2000
    CONSTRAINT connection_check CHECK ((end_date > begin_date)) --дата конца
больше даты начала
);
```

```sql
ALTER TABLE public.connection OWNER TO postgres;

--
-- TOC entry 211 (class 1259 OID 16439)
-- Name: contracts; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.contracts (
    id_contract integer NOT NULL,
    phone_num bigint NOT NULL,
    begin_date date NOT NULL,
    end_date date GENERATED ALWAYS AS ((begin_date + 365)) STORED NOT NULL --дата
окончания через год после даты начала
);


ALTER TABLE public.contracts OWNER TO postgres;

--
-- TOC entry 210 (class 1259 OID 16438)
-- Name: contracts_id_contract_seq; Type: SEQUENCE; Schema: public; Owner:
postgres
--

ALTER TABLE public.contracts ALTER COLUMN id_contract ADD GENERATED ALWAYS AS
IDENTITY ( --id генерируется автоматически
    SEQUENCE NAME public.contracts_id_contract_seq
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    MAXVALUE 10000
    CACHE 1
);



--
-- TOC entry 218 (class 1259 OID 16533)
-- Name: contracts_on_tariffs; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.contracts_on_tariffs (
    id_cot integer NOT NULL,
    id_tariff integer NOT NULL,
    id_contract integer NOT NULL,
    gb_remainder integer,
    sms_remainder integer,
    mins_remainder integer,
    begin_date date NOT NULL,
    end_date date NOT NULL,
    CONSTRAINT contracts_on_tariffs_begin_date_check CHECK ((begin_date > '2000-
01-01'::date)), --дата после 2000
```

```sql
    CONSTRAINT contracts_on_tariffs_check CHECK ((end_date > begin_date)), --дата
конца позже даты начала
    CONSTRAINT "positive gbs" CHECK ((gb_remainder > 0)), --положительный остаток
гб
    CONSTRAINT "positive mins" CHECK ((mins_remainder > 0)), --положительный
остаток минут
    CONSTRAINT "positive sms" CHECK ((sms_remainder > 0)) --положительный остаток
смс
);


ALTER TABLE public.contracts_on_tariffs OWNER TO postgres;

--
-- TOC entry 217 (class 1259 OID 16532)
-- Name: contracts_on_tariffs_id_cot_seq; Type: SEQUENCE; Schema: public; Owner:
postgres
--

ALTER TABLE public.contracts_on_tariffs ALTER COLUMN id_cot ADD GENERATED ALWAYS
AS IDENTITY ( --id генерируется автоматически
    SEQUENCE NAME public.contracts_on_tariffs_id_cot_seq
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    MAXVALUE 100000
    CACHE 1
);



--
-- TOC entry 222 (class 1259 OID 16581)
-- Name: external_resources; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.external_resources (
    id_ext_res integer NOT NULL,
    id_cot integer NOT NULL,
    payment_type character(1) NOT NULL,
    res_name character varying(30) NOT NULL,
    price real NOT NULL,
    begin_date date NOT NULL,
    end_date date NOT NULL,
    CONSTRAINT external_resources_begin_date_check CHECK ((begin_date > '2000-01-
01'::date)), --дата после 2000
    CONSTRAINT external_resources_check CHECK ((end_date > begin_date)), --дата
конца позже даты начала
    CONSTRAINT external_resources_price_check CHECK ((price > (0)::double
precision)) --положительная цена
);
```

```sql
ALTER TABLE public.external_resources OWNER TO postgres;

--
-- TOC entry 221 (class 1259 OID 16580)
-- Name: external_resources_id_ext_res_seq; Type: SEQUENCE; Schema: public;
Owner: postgres
--

ALTER TABLE public.external_resources ALTER COLUMN id_ext_res ADD GENERATED
ALWAYS AS IDENTITY ( --id генерируется автоматически
    SEQUENCE NAME public.external_resources_id_ext_res_seq
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    MAXVALUE 1000
    CACHE 1
);


--
-- TOC entry 214 (class 1259 OID 16489)
-- Name: tariffs; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.tariffs (
    id_tariff integer NOT NULL,
    tariff_cost integer NOT NULL,
    base_gb integer,
    base_sms integer,
    base_mins integer,
    tariff_name character varying NOT NULL,
    CONSTRAINT "positive cost" CHECK ((tariff_cost > 0)) --положительная цена
);


ALTER TABLE public.tariffs OWNER TO postgres;

--
-- TOC entry 213 (class 1259 OID 16488)
-- Name: tariffs_id_tariff_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--

ALTER TABLE public.tariffs ALTER COLUMN id_tariff ADD GENERATED ALWAYS AS
IDENTITY ( --id генерируется автоматически
    SEQUENCE NAME public.tariffs_id_tariff_seq
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    MAXVALUE 1000
    CACHE 1
);
```

```sql
--
-- TOC entry 209 (class 1259 OID 16421)
-- Name: users; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.users (
    phone_num bigint NOT NULL,
    user_name character varying(50) NOT NULL,
    city character varying(30) NOT NULL,
    country character varying(20) NOT NULL,
    CONSTRAINT "positive phone number" CHECK (((phone_num)::numeric >
(0)::numeric)) --номер телефона положительный
);


ALTER TABLE public.users OWNER TO postgres;


--
-- TOC entry 212 (class 1259 OID 16478)
-- Name: users_phone_num_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--

ALTER TABLE public.users ALTER COLUMN phone_num ADD GENERATED ALWAYS AS IDENTITY
( --номер телефона генерируется автоматически
    SEQUENCE NAME public.users_phone_num_seq
    START WITH 79000000000
    INCREMENT BY 1
    MINVALUE 79000000000
    MAXVALUE 79999999999
    CACHE 1
);



--
-- TOC entry 216 (class 1259 OID 16498)
-- Name: zones; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.zones (
    id_zone integer NOT NULL,
    country_prefix numeric(3,0) NOT NULL,
    price_per_minute real NOT NULL,
    country character varying(30) NOT NULL,
    CONSTRAINT "positive prefix" CHECK ((country_prefix > (0)::numeric)) --
префикс страны положительный
);


ALTER TABLE public.zones OWNER TO postgres;
```

```sql
--
-- TOC entry 215 (class 1259 OID 16497)
-- Name: zones_id_zone_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--

ALTER TABLE public.zones ALTER COLUMN id_zone ADD GENERATED ALWAYS AS IDENTITY (
--код зоны генерируется автоматически
    SEQUENCE NAME public.zones_id_zone_seq
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    MAXVALUE 100
    CACHE 1
);


--
-- TOC entry 3413 (class 0 OID 16596)
-- Dependencies: 224
-- Data for Name: additional_services; Type: TABLE DATA; Schema: public; Owner:
postgres
--

COPY public.additional_services (id_add_serv, price, payment_type, serv_name)
FROM stdin;
2    5    w    Черный список
3    1    d    Автоответчик
4    200  1    1 ГБ интернета
\.


--
-- TOC entry 3409 (class 0 OID 16554)
-- Dependencies: 220
-- Data for Name: calls; Type: TABLE DATA; Schema: public; Owner: postgres
--

COPY public.calls (id_call, id_cot, id_zone, payment_status, payment_date,
act_payment_date, payment_sum, duration, target_number, call_date, call_time)
FROM stdin;
4    5    2    t    2023-03-03    2023-03-03    0    65.7    79158191958 2023-03-
03   14:05:12+03
5    5    2    t    2023-03-04    2023-03-04    0    30.4    79253959150 2023-03-
04   11:25:25+03
6    5    2    t    2023-03-06    2023-03-06    0    23.6    79253959150 2023-03-
06   21:51:03+03
7    5    2    t    2023-03-07    2023-03-08    0    15.1    79115812039 2023-03-
07   09:10:11+03
8    5    3    t    2023-03-07    2023-03-08    21   42   79014024848 2023-03-
07   15:05:39+06
```

```
9	5	2	t	2023-03-10	2023-03-10	0	22.2	79581052840	2023-03-
10	22:38:28+03
10	6	2	t	2023-03-04	2023-03-04	0	10.1	78005553535	2023-03-
04	12:00:01+03
11	7	2	t	2023-03-04	2023-03-04	0	12.4	79999989999	2023-03-
04	11:14:11+03
12	7	4	t	2023-03-05	2023-03-06	10.25	20.5	375178465829	2023-03-
05	23:10:16+03
13	7	2	t	2023-03-06	2023-03-06	0	36.6	79214045002	2023-03-
06	16:40:17+03
14	7	2	t	2023-03-11	2023-03-11	0	30.7	79214045002	2023-03-
11	16:40:18+03
15	8	2	t	2023-03-07	2023-03-07	0	95.9	79624915028	2023-03-
07	17:30:02+03
16	8	2	t	2023-03-08	2023-03-08	0	59.5	79624915028	2023-03-
08	10:20:55+03
17	8	2	t	2023-03-08	2023-03-08	0	5	79624915028	2023-03-
08	18:08:08+03
18	8	2	t	2023-03-09	2023-03-09	0	71.6	79189194842	2023-03-
09	19:09:09+03
19	8	5	t	2023-03-10	2023-03-11	20	40	3727780980	2023-03-
09	23:35:52+02
20	9	2	t	2023-03-05	2023-03-05	0	7.1	78005553535	2023-03-
05	20:08:00+03
21	9	2	t	2023-03-05	2023-03-05	0	7.9	78005553535	2023-03-
05	20:17:18+03
22	9	2	t	2023-03-05	2023-03-05	0	8.1	78005553535	2023-03-
05	20:30:37+03
23	9	2	t	2023-03-06	2023-03-06	0	7.4	78125930202	2023-03-
06	11:11:11+03
24	9	2	t	2023-03-07	2023-03-07	0	6.6	79214020194	2023-03-
07	21:34:56+03
25	9	2	t	2023-03-08	2023-03-08	0	11.4	79214020194	2023-03-
08	04:20:02+03
26	10	2	t	2023-03-07	2023-03-07	0	15.6	79245815929	2023-03-
07	15:48:44+03
27	10	2	t	2023-03-08	2023-03-08	0	10.7	79245815929	2023-03-
08	15:46:07+03
28	10	2	t	2023-03-08	2023-03-08	0	5.9	79275104888	2023-03-
08	18:39:08+03
29	10	2	t	2023-03-11	2023-03-11	0	4	79245815929	2023-03-
11	15:45:55+03
30	10	2	t	2023-03-14	2023-03-14	0	20.1	79715912851	2023-03-
14	07:08:59+03
\.


--
-- TOC entry 3414 (class 0 OID 16606)
-- Dependencies: 225
-- Data for Name: connection; Type: TABLE DATA; Schema: public; Owner: postgres
```

```
--

COPY public.connection (id_cot, id_add_serv, begin_date, end_date) FROM stdin;
5	2	2023-03-05	2023-04-05
7	2	2023-03-08	2023-04-08
10	2	2023-03-12	2023-04-12
8	4	2023-03-11	2023-04-11
10	3	2023-03-13	2023-04-13
\.


--
-- TOC entry 3400 (class 0 OID 16439)
-- Dependencies: 211
-- Data for Name: contracts; Type: TABLE DATA; Schema: public; Owner: postgres
--

COPY public.contracts (id_contract, phone_num, begin_date) FROM stdin;
1	79000000000 2023-03-03
2	79000000001 2023-03-04
3	79000000002 2023-03-04
4	79000000003 2023-03-05
7	79000000004 2023-03-05
\.


--
-- TOC entry 3407 (class 0 OID 16533)
-- Dependencies: 218
-- Data for Name: contracts_on_tariffs; Type: TABLE DATA; Schema: public; Owner:
postgres
--

COPY public.contracts_on_tariffs (id_cot, id_tariff, id_contract, gb_remainder,
sms_remainder, mins_remainder, begin_date, end_date) FROM stdin;
5	1	1	98	967 801 2023-03-03	2024-03-02
6	1	2	80	1000	990 2023-03-04	2024-03-03
7	3	3	14	489 400 2023-03-04	2023-03-07
8	2	4	\N	354 228 2023-03-05	2024-03-04
9	1	7	94	994 944 2023-03-05	2024-03-04
10	1	3	97	980 951 2023-03-07	2024-03-03
\.


--
-- TOC entry 3411 (class 0 OID 16581)
-- Dependencies: 222
-- Data for Name: external_resources; Type: TABLE DATA; Schema: public; Owner:
postgres
--
```

```sql
COPY public.external_resources (id_ext_res, id_cot, payment_type, res_name,
price, begin_date, end_date) FROM stdin;
2	5	m	Мобильный кинотеатр	200	2023-03-15	2023-04-15
3	9	m	Бесплатные мессенджеры	300	2023-03-16	2023-04-16
\.


--
-- TOC entry 3403 (class 0 OID 16489)
-- Dependencies: 214
-- Data for Name: tariffs; Type: TABLE DATA; Schema: public; Owner: postgres
--

COPY public.tariffs (id_tariff, tariff_cost, base_gb, base_sms, base_mins,
tariff_name) FROM stdin;
1	1000	100	1000	1000	Безлимит
2	100	\N	500	500	Без интернета
3	300	15	500	500	Базовый
\.


--
-- TOC entry 3398 (class 0 OID 16421)
-- Dependencies: 209
-- Data for Name: users; Type: TABLE DATA; Schema: public; Owner: postgres
--

COPY public.users (phone_num, user_name, city, country) FROM stdin;
79000000000	Черкасов Василий Андреевич	Подольск	Россия
79000000001	Бипкин Евгений Васильевич	Воронеж	Россия
79000000002	Петров Денис Савельевич	Усть-Каменогорск	Казахстан
79000000003	Вересова Алина	Большой Камень	Россия
79000000004	Пономарева Валерия Александровна	Санкт-Петербург	Россия
\.


--
-- TOC entry 3405 (class 0 OID 16498)
-- Dependencies: 216
-- Data for Name: zones; Type: TABLE DATA; Schema: public; Owner: postgres
--

COPY public.zones (id_zone, country_prefix, price_per_minute, country) FROM
stdin;
2	7	0	Россия
3	7	0.5	Казахстан
4	375	0.5	Беларусь
5	372	0.5	Эстония
\.
```

```sql
--
-- TOC entry 3420 (class 0 OID 0)
-- Dependencies: 223
-- Name: additional_services_id_add_serv_seq; Type: SEQUENCE SET; Schema: public;
Owner: postgres
--

SELECT pg_catalog.setval('public.additional_services_id_add_serv_seq', 4, true);


--
-- TOC entry 3421 (class 0 OID 0)
-- Dependencies: 219
-- Name: calls_id_call_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres
--

SELECT pg_catalog.setval('public.calls_id_call_seq', 30, true);


--
-- TOC entry 3422 (class 0 OID 0)
-- Dependencies: 210
-- Name: contracts_id_contract_seq; Type: SEQUENCE SET; Schema: public; Owner:
postgres
--

SELECT pg_catalog.setval('public.contracts_id_contract_seq', 7, true);


--
-- TOC entry 3423 (class 0 OID 0)
-- Dependencies: 217
-- Name: contracts_on_tariffs_id_cot_seq; Type: SEQUENCE SET; Schema: public;
Owner: postgres
--

SELECT pg_catalog.setval('public.contracts_on_tariffs_id_cot_seq', 10, true);


--
-- TOC entry 3424 (class 0 OID 0)
-- Dependencies: 221
-- Name: external_resources_id_ext_res_seq; Type: SEQUENCE SET; Schema: public;
Owner: postgres
--

SELECT pg_catalog.setval('public.external_resources_id_ext_res_seq', 3, true);


--
-- TOC entry 3425 (class 0 OID 0)
```

```sql
--
-- Dependencies: 213
-- Name: tariffs_id_tariff_seq; Type: SEQUENCE SET; Schema: public; Owner:
postgres
--

SELECT pg_catalog.setval('public.tariffs_id_tariff_seq', 3, true);


--
-- TOC entry 3426 (class 0 OID 0)
-- Dependencies: 212
-- Name: users_phone_num_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres
--

SELECT pg_catalog.setval('public.users_phone_num_seq', 79000000004, true);


--
-- TOC entry 3427 (class 0 OID 0)
-- Dependencies: 215
-- Name: zones_id_zone_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres
--

SELECT pg_catalog.setval('public.zones_id_zone_seq', 5, true);


--
-- TOC entry 3205 (class 2606 OID 16517)
-- Name: contracts 21st century dates; Type: CHECK CONSTRAINT; Schema: public;
Owner: postgres
--

ALTER TABLE public.contracts
    ADD CONSTRAINT "21st century dates" CHECK ((begin_date > '2000-01-01'::date))
NOT VALID;


--
-- TOC entry 3229 (class 2606 OID 24583)
-- Name: additional_services additional_services_payment_type_check; Type: CHECK
CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE public.additional_services
    ADD CONSTRAINT additional_services_payment_type_check CHECK ((payment_type =
ANY (ARRAY['d'::bpchar, 'w'::bpchar, 'm'::bpchar, '1'::bpchar]))) NOT VALID;


--
-- TOC entry 3250 (class 2606 OID 16604)
```

```sql
--
-- Name: additional_services additional_services_pkey; Type: CONSTRAINT; Schema:
public; Owner: postgres
--

ALTER TABLE ONLY public.additional_services
    ADD CONSTRAINT additional_services_pkey PRIMARY KEY (id_add_serv); --id
первичный ключ


--
-- TOC entry 3220 (class 2606 OID 24590)
-- Name: calls calls_check; Type: CHECK CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE public.calls
    ADD CONSTRAINT calls_check CHECK ((payment_date >= call_date)) NOT VALID;


--
-- TOC entry 3221 (class 2606 OID 24591)
-- Name: calls calls_check1; Type: CHECK CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE public.calls
    ADD CONSTRAINT calls_check1 CHECK ((act_payment_date >= payment_date)) NOT
VALID;


--
-- TOC entry 3222 (class 2606 OID 24592)
-- Name: calls calls_payment_sum_check; Type: CHECK CONSTRAINT; Schema: public;
Owner: postgres
--

ALTER TABLE public.calls
    ADD CONSTRAINT calls_payment_sum_check CHECK ((payment_sum >= (0)::double
precision)) NOT VALID;


--
-- TOC entry 3246 (class 2606 OID 16565)
-- Name: calls calls_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.calls
    ADD CONSTRAINT calls_pkey PRIMARY KEY (id_call); --id первичный ключ


--
```

```sql
-- TOC entry 3244 (class 2606 OID 16542)
-- Name: contracts_on_tariffs contracts_on_tariffs_pkey; Type: CONSTRAINT;
Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.contracts_on_tariffs
    ADD CONSTRAINT contracts_on_tariffs_pkey PRIMARY KEY (id_cot); --id первичный
ключ


--
-- TOC entry 3238 (class 2606 OID 16444)
-- Name: contracts contracts_pkey; Type: CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE ONLY public.contracts
    ADD CONSTRAINT contracts_pkey PRIMARY KEY (id_contract); --id первичный ключ


--
-- TOC entry 3206 (class 2606 OID 16518)
-- Name: contracts correct sequence for dates; Type: CHECK CONSTRAINT; Schema:
public; Owner: postgres
--

ALTER TABLE public.contracts
    ADD CONSTRAINT "correct sequence for dates" CHECK ((end_date > begin_date))
NOT VALID;


--
-- TOC entry 3227 (class 2606 OID 24584)
-- Name: external_resources external_resources_payment_type_check; Type: CHECK
CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE public.external_resources
    ADD CONSTRAINT external_resources_payment_type_check CHECK ((payment_type =
ANY (ARRAY['d'::bpchar, 'w'::bpchar, 'm'::bpchar]))) NOT VALID;


--
-- TOC entry 3248 (class 2606 OID 16589)
-- Name: external_resources external_resources_pkey; Type: CONSTRAINT; Schema:
public; Owner: postgres
--

ALTER TABLE ONLY public.external_resources
    ADD CONSTRAINT external_resources_pkey PRIMARY KEY (id_ext_res); --id
первичный ключ
```

```sql
--
-- TOC entry 3208 (class 2606 OID 16510)
-- Name: tariffs positive gbs; Type: CHECK CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE public.tariffs
    ADD CONSTRAINT "positive gbs" CHECK ((base_gb > 0)) NOT VALID;


--
-- TOC entry 3209 (class 2606 OID 16511)
-- Name: tariffs positive mins; Type: CHECK CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE public.tariffs
    ADD CONSTRAINT "positive mins" CHECK ((base_mins > 0)) NOT VALID;


--
-- TOC entry 3210 (class 2606 OID 16509)
-- Name: tariffs positive sms; Type: CHECK CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE public.tariffs
    ADD CONSTRAINT "positive sms" CHECK ((base_sms > 0)) NOT VALID;


--
-- TOC entry 3240 (class 2606 OID 16496)
-- Name: tariffs tariffs_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.tariffs
    ADD CONSTRAINT tariffs_pkey PRIMARY KEY (id_tariff); --id первичный ключ


--
-- TOC entry 3234 (class 2606 OID 16470)
-- Name: users unique phone number; Type: CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE ONLY public.users
    ADD CONSTRAINT "unique phone number" UNIQUE (phone_num) DEFERRABLE INITIALLY
DEFERRED; --уникальный номер телефона
```

```sql
--
-- TOC entry 3236 (class 2606 OID 16468)
-- Name: users users_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.users
    ADD CONSTRAINT users_pkey PRIMARY KEY (phone_num); --номер телефона первичный
ключ


--
-- TOC entry 3242 (class 2606 OID 16503)
-- Name: zones zones_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.zones
    ADD CONSTRAINT zones_pkey PRIMARY KEY (id_zone); --id первичный ключ


--
-- TOC entry 3212 (class 2606 OID 24581)
-- Name: zones zones_price_per_minute_check; Type: CHECK CONSTRAINT; Schema:
public; Owner: postgres
--

ALTER TABLE public.zones
    ADD CONSTRAINT zones_price_per_minute_check CHECK ((price_per_minute >=
(0)::double precision)) NOT VALID;


--
-- TOC entry 3254 (class 2606 OID 16566)
-- Name: calls calls_id_cot_fkey; Type: FK CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE ONLY public.calls
    ADD CONSTRAINT calls_id_cot_fkey FOREIGN KEY (id_cot) REFERENCES
public.contracts_on_tariffs(id_cot) DEFERRABLE INITIALLY DEFERRED; --id контракта
на тарифе внешний ключ


--
-- TOC entry 3255 (class 2606 OID 16571)
-- Name: calls calls_id_zone_fkey; Type: FK CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE ONLY public.calls
    ADD CONSTRAINT calls_id_zone_fkey FOREIGN KEY (id_zone) REFERENCES
public.zones(id_zone) DEFERRABLE INITIALLY DEFERRED; --код зоны внешний ключ
```

```
--
-- TOC entry 3257 (class 2606 OID 16616)
-- Name: connection connection_id_add_serv_fkey; Type: FK CONSTRAINT; Schema:
public; Owner: postgres
--

ALTER TABLE ONLY public.connection
    ADD CONSTRAINT connection_id_add_serv_fkey FOREIGN KEY (id_add_serv)
REFERENCES public.additional_services(id_add_serv) DEFERRABLE INITIALLY DEFERRED;
--id доп услуги внешний ключ


--
-- TOC entry 3258 (class 2606 OID 16611)
-- Name: connection connection_id_cot_fkey; Type: FK CONSTRAINT; Schema: public;
Owner: postgres
--

ALTER TABLE ONLY public.connection
    ADD CONSTRAINT connection_id_cot_fkey FOREIGN KEY (id_cot) REFERENCES
public.contracts_on_tariffs(id_cot) DEFERRABLE INITIALLY DEFERRED; --id контракта
на тарифе внешний ключ


--
-- TOC entry 3252 (class 2606 OID 16548)
-- Name: contracts_on_tariffs contracts_on_tariffs_id_contract_fkey; Type: FK
CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.contracts_on_tariffs
    ADD CONSTRAINT contracts_on_tariffs_id_contract_fkey FOREIGN KEY
(id_contract) REFERENCES public.contracts(id_contract) DEFERRABLE INITIALLY
DEFERRED; --номер договора внешний ключ


--
-- TOC entry 3253 (class 2606 OID 16543)
-- Name: contracts_on_tariffs contracts_on_tariffs_id_tariff_fkey; Type: FK
CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.contracts_on_tariffs
    ADD CONSTRAINT contracts_on_tariffs_id_tariff_fkey FOREIGN KEY (id_tariff)
REFERENCES public.tariffs(id_tariff) DEFERRABLE INITIALLY DEFERRED; --id тарифа
внешний ключ


--
```

```
-- TOC entry 3251 (class 2606 OID 16483)
-- Name: contracts contracts_phone_num_fkey; Type: FK CONSTRAINT; Schema: public;
Owner: postgres
--

ALTER TABLE ONLY public.contracts
    ADD CONSTRAINT contracts_phone_num_fkey FOREIGN KEY (phone_num) REFERENCES
public.users(phone_num) MATCH FULL DEFERRABLE INITIALLY DEFERRED; --номер
телефона внешний ключ


--
-- TOC entry 3256 (class 2606 OID 16590)
-- Name: external_resources external_resources_id_cot_fkey; Type: FK CONSTRAINT;
Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.external_resources
    ADD CONSTRAINT external_resources_id_cot_fkey FOREIGN KEY (id_cot) REFERENCES
public.contracts_on_tariffs(id_cot) DEFERRABLE INITIALLY DEFERRED; --id контракта
на тарифе внешний ключ


-- Completed on 2023-04-16 14:57:42


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

Выводы:

По результатам данной лабораторной работы были получены навыки работы
с PostgreSQL при помощи pgAdmin, создана и заполнена тестовыми данными
база данных, составлены ограничения и настроены связи между таблицами.