УНИВЕРСИТЕТ ИТМО
ФАКУЛЬТЕТ СРЕДНЕГО ПРОФЕССИОНАЛЬНОГО ОБРАЗОВАНИЯ

ОТЧЕТ
О ЛАБОРАТОРНОЙ РАБОТЕ № 4

По теме: Анализ данных. Создание таблиц базы данных PostgreSQL.
Заполнение таблиц рабочими данными.
По дисциплине: Основы проектирования баз данных
Специальность 09.02.07 «Информационные системы и программирование»

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Цель работы: овладеть практическими навыками создания таблиц базы данных PostgreSQL 10 (11), заполнения их рабочими данными, резервного копирования и восстановления БД.

Оборудование: лаборатория управления проектной деятельностью, оснащенная компьютерами с доступом в Интернет, предназначенными для работы студентов в электронной образовательной среде выполнения лабораторных заданий.

Программное обеспечение: СУБД PostgreSQL 10 (11), pgadmin 4.

Практическое задание:

1. Создать базу данных с использованием pgadmin 4 (согласно индивидуальному заданию).
2. Создать схему в составе базы данных.
3. Создать таблицы базы данных.
4. Заполнить таблицы БД рабочими данными.
5. Создать резервную копию БД.
6. Восстановить БД на другом ПК.

Выполнение задания:

Dump, содержащий скрипты работы БД, представлен ниже:

```
CREATE DATABASE "Biblioteka" WITH TEMPLATE = template0 ENCODING =
'UTF8' LC_COLLATE = 'Russian_Russia.1251' LC_CTYPE =
'Russian_Russia.1251';


ALTER DATABASE "Biblioteka" OWNER TO postgres;

\connect "Biblioteka"

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 = '';
```

```
SET default_table_access_method = heap;

--
-- Name: Accounting; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public."Accounting" (
    "Shifr_knigi" integer NOT NULL,
    "Name" text NOT NULL,
    "Name_new_book" text NOT NULL,
    "Number_of_new_instances" integer NOT NULL,
    "Number_of_copies_written_off" integer NOT NULL,
    "Name_of_the_books_written_off" text NOT NULL
);


ALTER TABLE public."Accounting" OWNER TO postgres;

--
-- Name: Book; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public."Book" (
    "Shifr_knigi" integer NOT NULL,
    "Name" text NOT NULL,
    "Author" text NOT NULL,
    "Publishing_house" text NOT NULL,
    "Year_publishing" date NOT NULL,
    "Section" text NOT NULL,
    "Chislo_exempl_v_kajdom_zale" integer NOT NULL
);


ALTER TABLE public."Book" OWNER TO postgres;

--
-- Name: Fastening; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public."Fastening" (
    "Nomer_chit_bileta" integer NOT NULL,
    "Room_number" integer NOT NULL,
    "Date_assigned_to_a_particular_room" date NOT NULL,
    "Date_of_transfer_to_another_room" date NOT NULL
);


ALTER TABLE public."Fastening" OWNER TO postgres;

--
-- Name: Library; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public."Library" (
    "Name" text NOT NULL,
    "Year_of_foundation" date NOT NULL,
    "Address" text NOT NULL,
```

```
    "Schedule" text NOT NULL,
    "Phone_number" numeric NOT NULL
);


ALTER TABLE public."Library" OWNER TO postgres;

--
-- Name: Library_worker; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public."Library_worker" (
    "Id_worker" integer NOT NULL,
    "Name" text NOT NULL,
    "Employment_date" date NOT NULL,
    "FIO" text NOT NULL,
    "Schedule" text NOT NULL
);


ALTER TABLE public."Library_worker" OWNER TO postgres;

--
-- Name: Poluchenie_exemplyara_knigi; Type: TABLE; Schema: public;
Owner: postgres
--

CREATE TABLE public."Poluchenie_exemplyara_knigi" (
    "Shifr_exemplyara_knigi" integer NOT NULL,
    "Shifr_knigi" integer NOT NULL,
    "Sostoyanie" text NOT NULL
);


ALTER TABLE public."Poluchenie_exemplyara_knigi" OWNER TO postgres;

--
-- Name: Poluchenie_knigi; Type: TABLE; Schema: public; Owner:
postgres
--

CREATE TABLE public."Poluchenie_knigi" (
    "Nomer_chit_bileta" integer NOT NULL,
    "Shifr_exemplyara_knigi" integer NOT NULL,
    "Shifr_knigi" integer NOT NULL,
    "Data_zakrepl_knigi_za_chitatelem" date NOT NULL,
    "Data_vozvrata_knigi" date NOT NULL,
    "Kolichestvo_poluch_knig" integer NOT NULL,
    "Kolichestvo_vozvrash_knig" integer NOT NULL
);


ALTER TABLE public."Poluchenie_knigi" OWNER TO postgres;

--
-- Name: Reader; Type: TABLE; Schema: public; Owner: postgres
--
```

```
CREATE TABLE public."Reader" (
    "Nomer_chit_bileta" integer NOT NULL,
    "FIO" text NOT NULL,
    "Nomer_passporta" integer NOT NULL,
    "Adress" text NOT NULL,
    "Phone_number" numeric NOT NULL,
    "Education" text NOT NULL,
    "Nalichie_ychenoy_stepeni" text NOT NULL,
    "Date_of_birth" date NOT NULL
);


ALTER TABLE public."Reader" OWNER TO postgres;

--
-- Name: Reading_room; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public."Reading_room" (
    "Room_number" integer NOT NULL,
    "Name" text NOT NULL,
    "Capacity" integer NOT NULL
);


ALTER TABLE public."Reading_room" OWNER TO postgres;

--
-- Name: Registration; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public."Registration" (
    "Nomer_chit_bileta" integer NOT NULL,
    "Name" text NOT NULL,
    "Date_recorded_to_the_library" date NOT NULL,
    "Date_of_discharge_from_the_library" date NOT NULL
);


ALTER TABLE public."Registration" OWNER TO postgres;

--
-- Name: Visit; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public."Visit" (
    "Nomer_chit_bileta" integer NOT NULL,
    "Room_number" integer NOT NULL,
    "Number_visited" integer[] NOT NULL
);


ALTER TABLE public."Visit" OWNER TO postgres;

--
-- Data for Name: Accounting; Type: TABLE DATA; Schema: public; Owner:
postgres
--
```

```
COPY public."Accounting" ("Shifr_knigi", "Name", "Name_new_book",
"Number_of_new_instances", "Number_of_copies_written_off",
"Name_of_the_books_written_off") FROM stdin;
\.
COPY public."Accounting" ("Shifr_knigi", "Name", "Name_new_book",
"Number_of_new_instances", "Number_of_copies_written_off",
"Name_of_the_books_written_off") FROM '$$PATH$$/2898.dat';

--
-- Data for Name: Book; Type: TABLE DATA; Schema: public; Owner:
postgres
--

COPY public."Book" ("Shifr_knigi", "Name", "Author",
"Publishing_house", "Year_publishing", "Section",
"Chislo_exempl_v_kajdom_zale") FROM stdin;
\.
COPY public."Book" ("Shifr_knigi", "Name", "Author",
"Publishing_house", "Year_publishing", "Section",
"Chislo_exempl_v_kajdom_zale") FROM '$$PATH$$/2895.dat';

--
-- Data for Name: Fastening; Type: TABLE DATA; Schema: public; Owner:
postgres
--

COPY public."Fastening" ("Nomer_chit_bileta", "Room_number",
"Date_assigned_to_a_particular_room",
"Date_of_transfer_to_another_room") FROM stdin;
\.
COPY public."Fastening" ("Nomer_chit_bileta", "Room_number",
"Date_assigned_to_a_particular_room",
"Date_of_transfer_to_another_room") FROM '$$PATH$$/2902.dat';

--
-- Data for Name: Library; Type: TABLE DATA; Schema: public; Owner:
postgres
--

COPY public."Library" ("Name", "Year_of_foundation", "Address",
"Schedule", "Phone_number") FROM stdin;
\.
COPY public."Library" ("Name", "Year_of_foundation", "Address",
"Schedule", "Phone_number") FROM '$$PATH$$/2897.dat';

--
-- Data for Name: Library_worker; Type: TABLE DATA; Schema: public;
Owner: postgres
--

COPY public."Library_worker" ("Id_worker", "Name", "Employment_date",
"FIO", "Schedule") FROM stdin;
\.
COPY public."Library_worker" ("Id_worker", "Name", "Employment_date",
"FIO", "Schedule") FROM '$$PATH$$/2899.dat';

--
```

```
-- Data for Name: Poluchenie_exemplyara_knigi; Type: TABLE DATA;
Schema: public; Owner: postgres
--

COPY public."Poluchenie_exemplyara_knigi" ("Shifr_exemplyara_knigi",
"Shifr_knigi", "Sostoyanie") FROM stdin;
\.
COPY public."Poluchenie_exemplyara_knigi" ("Shifr_exemplyara_knigi",
"Shifr_knigi", "Sostoyanie") FROM '$$PATH$$/2894.dat';

--
-- Data for Name: Poluchenie_knigi; Type: TABLE DATA; Schema: public;
Owner: postgres
--

COPY public."Poluchenie_knigi" ("Nomer_chit_bileta",
"Shifr_exemplyara_knigi", "Shifr_knigi",
"Data_zakrepl_knigi_za_chitatelem", "Data_vozvrata_knigi",
"Kolichestvo_poluch_knig", "Kolichestvo_vozvrash_knig") FROM stdin;
\.
COPY public."Poluchenie_knigi" ("Nomer_chit_bileta",
"Shifr_exemplyara_knigi", "Shifr_knigi",
"Data_zakrepl_knigi_za_chitatelem", "Data_vozvrata_knigi",
"Kolichestvo_poluch_knig", "Kolichestvo_vozvrash_knig") FROM
'$$PATH$$/2893.dat';

--
-- Data for Name: Reader; Type: TABLE DATA; Schema: public; Owner:
postgres
--

COPY public."Reader" ("Nomer_chit_bileta", "FIO", "Nomer_passporta",
"Adress", "Phone_number", "Education", "Nalichie_ychenoy_stepeni",
"Date_of_birth") FROM stdin;
\.
COPY public."Reader" ("Nomer_chit_bileta", "FIO", "Nomer_passporta",
"Adress", "Phone_number", "Education", "Nalichie_ychenoy_stepeni",
"Date_of_birth") FROM '$$PATH$$/2892.dat';

--
-- Data for Name: Reading_room; Type: TABLE DATA; Schema: public;
Owner: postgres
--

COPY public."Reading_room" ("Room_number", "Name", "Capacity") FROM
stdin;
\.
COPY public."Reading_room" ("Room_number", "Name", "Capacity") FROM
'$$PATH$$/2900.dat';

--
-- Data for Name: Registration; Type: TABLE DATA; Schema: public;
Owner: postgres
--

COPY public."Registration" ("Nomer_chit_bileta", "Name",
"Date_recorded_to_the_library", "Date_of_discharge_from_the_library")
FROM stdin;
```

```
\.
COPY public."Registration" ("Nomer_chit_bileta", "Name",
"Date_recorded_to_the_library", "Date_of_discharge_from_the_library")
FROM '$$PATH$$/2896.dat';

--
-- Data for Name: Visit; Type: TABLE DATA; Schema: public; Owner:
postgres
--

COPY public."Visit" ("Nomer_chit_bileta", "Room_number",
"Number_visited") FROM stdin;
\.
COPY public."Visit" ("Nomer_chit_bileta", "Room_number",
"Number_visited") FROM '$$PATH$$/2901.dat';

--
-- Name: Accounting Accounting_pkey; Type: CONSTRAINT; Schema: public;
Owner: postgres
--

ALTER TABLE ONLY public."Accounting"
    ADD CONSTRAINT "Accounting_pkey" PRIMARY KEY ("Shifr_knigi");


--
-- Name: Fastening Fastening_pkey; Type: CONSTRAINT; Schema: public;
Owner: postgres
--

ALTER TABLE ONLY public."Fastening"
    ADD CONSTRAINT "Fastening_pkey" PRIMARY KEY ("Nomer_chit_bileta",
"Room_number");


--
-- Name: Library_worker Library worker_pkey; Type: CONSTRAINT; Schema:
public; Owner: postgres
--

ALTER TABLE ONLY public."Library_worker"
    ADD CONSTRAINT "Library worker_pkey" PRIMARY KEY ("Id_worker",
"Name");


--
-- Name: Library Name; Type: CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE ONLY public."Library"
    ADD CONSTRAINT "Name" PRIMARY KEY ("Name");


--
-- Name: Reader Nomer_chit_bileta; Type: CONSTRAINT; Schema: public;
Owner: postgres
--
```

```
ALTER TABLE ONLY public."Reader"
    ADD CONSTRAINT "Nomer_chit_bileta" PRIMARY KEY
("Nomer_chit_bileta");


--
-- Name: Poluchenie_knigi Poluchenie_knigi_pkey; Type: CONSTRAINT;
Schema: public; Owner: postgres
--

ALTER TABLE ONLY public."Poluchenie_knigi"
    ADD CONSTRAINT "Poluchenie_knigi_pkey" PRIMARY KEY
("Nomer_chit_bileta");


--
-- Name: Reading_room Reading_room_pkey; Type: CONSTRAINT; Schema:
public; Owner: postgres
--

ALTER TABLE ONLY public."Reading_room"
    ADD CONSTRAINT "Reading_room_pkey" PRIMARY KEY ("Room_number");


--
-- Name: Poluchenie_exemplyara_knigi Shifr_exemplyara_knigi; Type:
CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public."Poluchenie_exemplyara_knigi"
    ADD CONSTRAINT "Shifr_exemplyara_knigi" PRIMARY KEY
("Shifr_exemplyara_knigi");


--
-- Name: Book Shifr_knigi; Type: CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE ONLY public."Book"
    ADD CONSTRAINT "Shifr_knigi" PRIMARY KEY ("Shifr_knigi");


--
-- Name: Visit Visit_pkey; Type: CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE ONLY public."Visit"
    ADD CONSTRAINT "Visit_pkey" PRIMARY KEY ("Nomer_chit_bileta",
"Room_number");


--
-- Name: Registration Name; Type: FK CONSTRAINT; Schema: public;
Owner: postgres
--
```

```
ALTER TABLE ONLY public."Registration"
    ADD CONSTRAINT "Name" FOREIGN KEY ("Name") REFERENCES
public."Library"("Name") NOT VALID;


--
-- Name: Library_worker Name; Type: FK CONSTRAINT; Schema: public;
Owner: postgres
--

ALTER TABLE ONLY public."Library_worker"
    ADD CONSTRAINT "Name" FOREIGN KEY ("Name") REFERENCES
public."Library"("Name");


--
-- Name: Poluchenie_knigi Nomer_chit_bileta; Type: FK CONSTRAINT;
Schema: public; Owner: postgres
--

ALTER TABLE ONLY public."Poluchenie_knigi"
    ADD CONSTRAINT "Nomer_chit_bileta" FOREIGN KEY
("Nomer_chit_bileta") REFERENCES public."Reader"("Nomer_chit_bileta")
NOT VALID;


--
-- Name: Registration Nomer_chit_bileta; Type: FK CONSTRAINT; Schema:
public; Owner: postgres
--

ALTER TABLE ONLY public."Registration"
    ADD CONSTRAINT "Nomer_chit_bileta" FOREIGN KEY
("Nomer_chit_bileta") REFERENCES public."Reader"("Nomer_chit_bileta");


--
-- Name: Visit Nomer_chit_bileta; Type: FK CONSTRAINT; Schema: public;
Owner: postgres
--

ALTER TABLE ONLY public."Visit"
    ADD CONSTRAINT "Nomer_chit_bileta" FOREIGN KEY
("Nomer_chit_bileta") REFERENCES public."Reader"("Nomer_chit_bileta");


--
-- Name: Fastening Nomer_chit_bileta; Type: FK CONSTRAINT; Schema:
public; Owner: postgres
--

ALTER TABLE ONLY public."Fastening"
    ADD CONSTRAINT "Nomer_chit_bileta" FOREIGN KEY
("Nomer_chit_bileta") REFERENCES public."Reader"("Nomer_chit_bileta");


--
```

```
-- Name: Visit Room_number; Type: FK CONSTRAINT; Schema: public;
Owner: postgres
--

ALTER TABLE ONLY public."Visit"
    ADD CONSTRAINT "Room_number" FOREIGN KEY ("Room_number")
REFERENCES public."Reading_room"("Room_number");


--
-- Name: Fastening Room_number; Type: FK CONSTRAINT; Schema: public;
Owner: postgres
--

ALTER TABLE ONLY public."Fastening"
    ADD CONSTRAINT "Room_number" FOREIGN KEY ("Room_number")
REFERENCES public."Reading_room"("Room_number") NOT VALID;


--
-- Name: Poluchenie_knigi Shifr_exemplyara_knig; Type: FK CONSTRAINT;
Schema: public; Owner: postgres
--

ALTER TABLE ONLY public."Poluchenie_knigi"
    ADD CONSTRAINT "Shifr_exemplyara_knig" FOREIGN KEY
("Shifr_exemplyara_knigi") REFERENCES
public."Poluchenie_exemplyara_knigi"("Shifr_exemplyara_knigi") NOT
VALID;


--
-- Name: Poluchenie_knigi Shifr_knig; Type: FK CONSTRAINT; Schema:
public; Owner: postgres
--

ALTER TABLE ONLY public."Poluchenie_knigi"
    ADD CONSTRAINT "Shifr_knig" FOREIGN KEY ("Shifr_knigi") REFERENCES
public."Book"("Shifr_knigi") NOT VALID;


--
-- Name: Poluchenie_exemplyara_knigi Shifr_knigi; Type: FK CONSTRAINT;
Schema: public; Owner: postgres
--

ALTER TABLE ONLY public."Poluchenie_exemplyara_knigi"
    ADD CONSTRAINT "Shifr_knigi" FOREIGN KEY ("Shifr_knigi")
REFERENCES public."Book"("Shifr_knigi") NOT VALID;


--
-- Name: Accounting Shifr_knigi; Type: FK CONSTRAINT; Schema: public;
Owner: postgres
--

ALTER TABLE ONLY public."Accounting"
```

```
    ADD CONSTRAINT "Shifr_knigi" FOREIGN KEY ("Shifr_knigi")
REFERENCES public."Book"("Shifr_knigi");


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

Вывод: в ходе выполнения лабораторной работы №4 было получены практические навыки создания таблиц базы данных PostgreSQL 12, заполнения их рабочими данными, резервного копирования и восстановления баз данных.