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федеральное государственное автономное образовательное учреждение высшего
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«Национальный исследовательский университет ИТМО»

Факультет инфокоммуникационных технологий

ЛАБОРАТОРНАЯ РАБОТА №1

**АНАЛИЗ ДАННЫХ. ПОСТРОЕНИЕ ИНФОЛОГИЧЕСКОЙ МОДЕЛИ
ДАННЫХ БД**

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

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Цель лабораторной работы: овладеть практическими навыками создания таблиц базы данных PostgreSQL 1X, заполнения их рабочими данными, резервного копирования и восстановления БД.

Задачи:

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.
 - a. с расширением CUSTOM для восстановления БД;
 - b. с расширением PLAIN для листинга (в отчете);
 - c. при создании резервных копий БД настроить параметры Dump options для Type of objects и Queries.
7. Восстановить БД

Индивидуальное задание. Вариант 15.

Описание предметной области: БД образовательной организации содержит сведения об аудиториях и расписании проводимых в них занятий. Занятия проводятся на разных площадках. Время начала и окончания занятия по дням недели фиксировано. База данных используется для получения справок о наличии свободных аудиторий в указанное время, о месте и времени проведения определенных занятий.

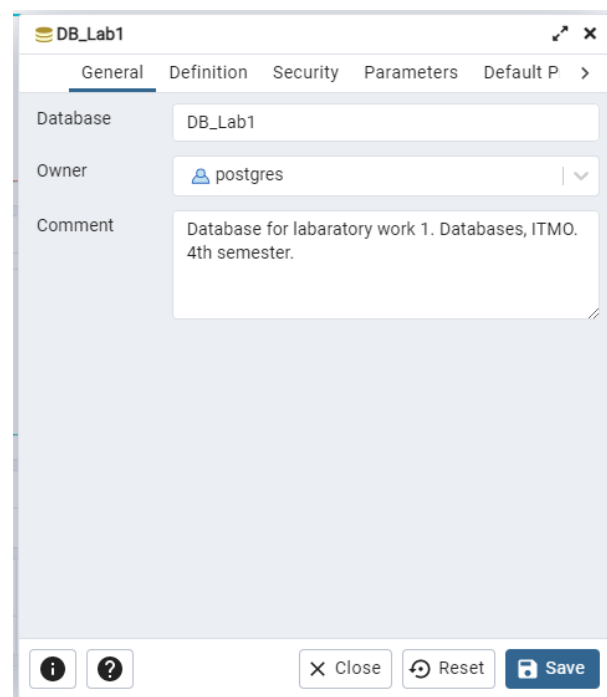
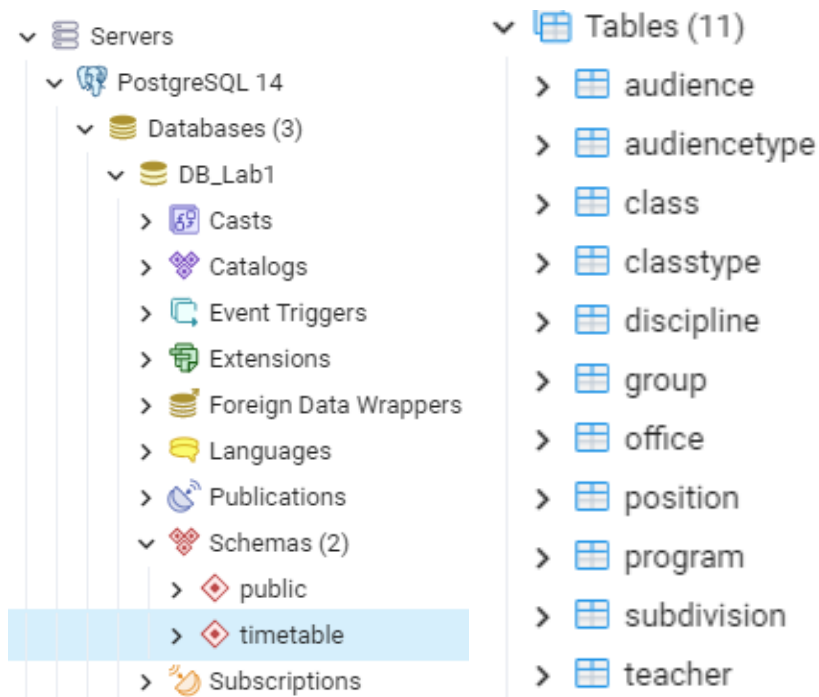
БД должна содержать следующий минимальный набор сведений:

- | | |
|------------------------------|---|
| - Номер аудитории. | - Название направления. |
| - Количество мест. | - Код подразделения. |
| - Тип аудитории. | - Название подразделения. |
| - Название площадки. | - Максимально возможное количество студентов для посещения занятия. |
| - Адрес площадки. | - Дата. |
| - Код дисциплины. | - День недели. |
| - Название дисциплины. | - Время начала занятия. |
| - Вид занятия. | - Время окончания занятия. |
| - ФИО преподавателя. | |
| - Должность преподавателя. | |
| - Номер студенческой группы. | |
| - Учебный год. | |
| - Код направления. | |

Выполнение

Создание БД и создание схемы БД

Представлено на рисунках 1 и 2. Название базы данных DB_Lab1, название схемы timetable. Также созданы соответствующие таблицы, представлены на рисунке 3. Установлены различного рода ограничения на поля. Таблицы заполнены данными.



Рисунки 1, 2, 3 - создание базы данных, схемы и таблиц

Резервное копирование

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

-- Dumped from database version 14.2
-- Dumped by pg_dump version 14.2

-- Started on 2022-03-03 12:45:42

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;

DROP DATABASE "DB_LAB1";
--
-- TOC entry 3424 (class 1262 OID 16859)
-- Name: DB_LAB1; Type: DATABASE; Schema: -;
-- Owner: postgres
--

CREATE DATABASE "DB_LAB1" WITH
    TEMPLATE = template0 ENCODING = 'UTF8'
    LOCALE = 'English_United States.1252';

ALTER DATABASE "DB_LAB1" OWNER TO
postgres;

\connect "DB_LAB1"

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 16860)
-- Name: timetable; Type: SCHEMA; Schema: -;
-- Owner: postgres
--
```

```
CREATE SCHEMA timetable;
```

```
ALTER SCHEMA timetable OWNER TO postgres;
```

```
--
-- TOC entry 3425 (class 0 OID 0)
-- Dependencies: 5
-- Name: SCHEMA timetable; Type: COMMENT;
-- Schema: -; Owner: postgres
--
```

```
COMMENT ON SCHEMA timetable IS 'database of
educational organisation';
```

```
SET default_tablespace = '';
```

```
SET default_table_access_method = heap;
```

```
--
-- TOC entry 210 (class 1259 OID 16861)
-- Name: audience; Type: TABLE; Schema: timetable;
-- Owner: postgres
--
```

```
CREATE TABLE timetable.audience (
    audience_id integer NOT NULL,
    audiencetype_id integer NOT NULL,
    office_id integer NOT NULL,
```

```

    audience_capacity integer NOT NULL,
    audience_number character varying(6) NOT NULL
);

ALTER TABLE timetable.audience OWNER TO
    postgres;

--
-- TOC entry 211 (class 1259 OID 16864)
-- Name: audiencetype; Type: TABLE; Schema:
    timetable; Owner: postgres
--

CREATE TABLE timetable.audiencetype (
    audiencetype_id integer NOT NULL,
    audiencetype_name character varying(16) NOT
        NULL
);

ALTER TABLE timetable.audiencetype OWNER TO
    postgres;

--
-- TOC entry 212 (class 1259 OID 16867)
-- Name: class; Type: TABLE; Schema: timetable;
    Owner: postgres
--

CREATE TABLE timetable.class (
    class_id integer NOT NULL,
    group_id integer NOT NULL,
    discipline_id integer NOT NULL,
    audience_id integer NOT NULL,
    teacher_id integer NOT NULL,
    class_date date NOT NULL,
    class_start time with time zone NOT NULL,
    class_end time with time zone NOT NULL,
    classtype_id integer NOT NULL
);

ALTER TABLE timetable.class OWNER TO postgres;

--
-- TOC entry 213 (class 1259 OID 16870)
-- Name: classtype; Type: TABLE; Schema: timetable;
    Owner: postgres
--

CREATE TABLE timetable.classtype (
    classtype_id integer NOT NULL,
    classtype_name character varying(12) NOT NULL
);

ALTER TABLE timetable.classtype OWNER TO
    postgres;

--
-- TOC entry 214 (class 1259 OID 16873)
-- Name: discipline; Type: TABLE; Schema: timetable;
    Owner: postgres
--

CREATE TABLE timetable.discipline (
    discipline_id integer NOT NULL,
    discipline_name character varying(32) NOT NULL,
    implementer_id integer NOT NULL,
    hours_lecture integer,
    hours_practice integer,
    hours_lab integer

```

```

);

ALTER TABLE timetable.discipline OWNER TO
    postgres;

--
-- TOC entry 215 (class 1259 OID 16876)
-- Name: group; Type: TABLE; Schema: timetable;
    Owner: postgres
--

CREATE TABLE timetable."group" (
    group_id integer NOT NULL,
    group_code character varying(6) NOT NULL,
    group_numberofstudents integer NOT NULL,
    program_id integer NOT NULL,
    group_yearstart integer NOT NULL
);

ALTER TABLE timetable."group" OWNER TO
    postgres;

--
-- TOC entry 216 (class 1259 OID 16879)
-- Name: office; Type: TABLE; Schema: timetable;
    Owner: postgres
--

CREATE TABLE timetable.office (
    office_id integer NOT NULL,
    office_address character varying(50) NOT NULL,
    office_name character varying(20) NOT NULL
);

ALTER TABLE timetable.office OWNER TO
    postgres;

--
-- TOC entry 217 (class 1259 OID 16882)
-- Name: position; Type: TABLE; Schema: timetable;
    Owner: postgres
--

CREATE TABLE timetable."position" (
    position_id integer NOT NULL,
    position_name character varying(32) NOT NULL
);

ALTER TABLE timetable."position" OWNER TO
    postgres;

--
-- TOC entry 218 (class 1259 OID 16885)
-- Name: program; Type: TABLE; Schema: timetable;
    Owner: postgres
--

CREATE TABLE timetable.program (
    program_id integer NOT NULL,
    program_name character varying(64) NOT NULL,
    program_code character(8) NOT NULL,
    subdivision_id integer NOT NULL
);

ALTER TABLE timetable.program OWNER TO
    postgres;

--

```

```

-- TOC entry 219 (class 1259 OID 16888)
-- Name: subdivision; Type: TABLE; Schema:
   timetable; Owner: postgres
--
CREATE TABLE timetable.subdivision (
    subdivision_id integer NOT NULL,
    subdivision_name character varying(64) NOT
        NULL,
    subdivision_abbreviation character varying(8) NOT
        NULL
);

ALTER TABLE timetable.subdivision OWNER TO
    postgres;

--
-- TOC entry 220 (class 1259 OID 16891)
-- Name: teacher; Type: TABLE; Schema: timetable;
   Owner: postgres
--
CREATE TABLE timetable.teacher (
    teacher_id integer NOT NULL,
    teacher_surname character varying(16) NOT NULL,
    teacher_name character varying(12) NOT NULL,
    teacher_patronymic character varying(16),
    position_id integer NOT NULL,
    teacher_staffnumber character varying(8) NOT
        NULL
);

ALTER TABLE timetable.teacher OWNER TO
    postgres;

--
-- TOC entry 3408 (class 0 OID 16861)
-- Dependencies: 210
-- Data for Name: audience; Type: TABLE DATA;
   Schema: timetable; Owner: postgres
--
INSERT INTO timetable.audience (audience_id,
    audiencetype_id, office_id, audience_capacity,
    audience_number) VALUES (1, 3, 2, 30, '32-54');
INSERT INTO timetable.audience (audience_id,
    audiencetype_id, office_id, audience_capacity,
    audience_number) VALUES (2, 1, 1, 300,
    '93n234');

--
-- TOC entry 3409 (class 0 OID 16864)
-- Dependencies: 211
-- Data for Name: audiencetype; Type: TABLE DATA;
   Schema: timetable; Owner: postgres
--
INSERT INTO timetable.audiencetype
    (audiencetype_id, audiencetype_name) VALUES
    (1, 'Актный зал');
INSERT INTO timetable.audiencetype
    (audiencetype_id, audiencetype_name) VALUES
    (2, 'Кабинет');
INSERT INTO timetable.audiencetype
    (audiencetype_id, audiencetype_name) VALUES
    (3, 'Коворкинг');
INSERT INTO timetable.audiencetype
    (audiencetype_id, audiencetype_name) VALUES
    (4, 'Лаборатория');

```

```

--
-- TOC entry 3410 (class 0 OID 16867)
-- Dependencies: 212
-- Data for Name: class; Type: TABLE DATA; Schema:
   timetable; Owner: postgres
--
INSERT INTO timetable.class (class_id, group_id,
    discipline_id, audience_id, teacher_id, class_date,
    class_start, class_end, classtype_id) VALUES (1, 1,
    1, 1, 1, '2022-03-22', '08:20:00+00', '09:50:00+00',
    1);
INSERT INTO timetable.class (class_id, group_id,
    discipline_id, audience_id, teacher_id, class_date,
    class_start, class_end, classtype_id) VALUES (2, 1,
    2, 2, 3, '2022-03-22', '10:00:00+00', '10:30:00+00',
    3);
INSERT INTO timetable.class (class_id, group_id,
    discipline_id, audience_id, teacher_id, class_date,
    class_start, class_end, classtype_id) VALUES (3, 2,
    3, 2, 2, '2022-03-22', '08:20:00+00', '09:50:00+00',
    2);

--
-- TOC entry 3411 (class 0 OID 16870)
-- Dependencies: 213
-- Data for Name: classtype; Type: TABLE DATA;
   Schema: timetable; Owner: postgres
--
INSERT INTO timetable.classtype (classtype_id,
    classtype_name) VALUES (1, 'практика');
INSERT INTO timetable.classtype (classtype_id,
    classtype_name) VALUES (2, 'лекция');
INSERT INTO timetable.classtype (classtype_id,
    classtype_name) VALUES (3, 'лабораторная');
INSERT INTO timetable.classtype (classtype_id,
    classtype_name) VALUES (4, 'консультация');

--
-- TOC entry 3412 (class 0 OID 16873)
-- Dependencies: 214
-- Data for Name: discipline; Type: TABLE DATA;
   Schema: timetable; Owner: postgres
--
INSERT INTO timetable.discipline (discipline_id,
    discipline_name, implementer_id, hours_lecture,
    hours_practice, hours_lab) VALUES (1,
    'Философия', 2, 16, 16, NULL);
INSERT INTO timetable.discipline (discipline_id,
    discipline_name, implementer_id, hours_lecture,
    hours_practice, hours_lab) VALUES (2,
    'Машинное обучение', 3, 8, 32, 32);
INSERT INTO timetable.discipline (discipline_id,
    discipline_name, implementer_id, hours_lecture,
    hours_practice, hours_lab) VALUES (3,
    'Французский язык', 1, NULL, 60, NULL);

--
-- TOC entry 3413 (class 0 OID 16876)
-- Dependencies: 215
-- Data for Name: group; Type: TABLE DATA;
   Schema: timetable; Owner: postgres
--
INSERT INTO timetable."group" (group_id,
    group_code, group_numberofstudents, program_id,
    group_yearstart) VALUES (1, 'lklk43', 30, 1,

```

```

2019);
INSERT INTO timetable."group" (group_id,
group_code, group_numberofstudents, program_id,
group_yearstart) VALUES (2, 'sefs56', 12, 3,
2020);

```

```

--
-- TOC entry 3414 (class 0 OID 16879)
-- Dependencies: 216
-- Data for Name: office; Type: TABLE DATA;
-- Schema: timetable; Owner: postgres
--

```

```

INSERT INTO timetable.office (office_id,
office_address, office_name) VALUES (1, 'ул.
Ленина д.15', 'ЛЕНКОПИ');
INSERT INTO timetable.office (office_id,
office_address, office_name) VALUES (2, 'пр.
Дружбы д.1/4', 'ДРУЖБКОПИ');

```

```

--
-- TOC entry 3415 (class 0 OID 16882)
-- Dependencies: 217
-- Data for Name: position; Type: TABLE DATA;
-- Schema: timetable; Owner: postgres
--

```

```

INSERT INTO timetable."position" (position_id,
position_name) VALUES (1, 'преподаватель');
INSERT INTO timetable."position" (position_id,
position_name) VALUES (2, 'научный
сотрудник');
INSERT INTO timetable."position" (position_id,
position_name) VALUES (3, 'доцент');
INSERT INTO timetable."position" (position_id,
position_name) VALUES (4, 'ассистент');

```

```

--
-- TOC entry 3416 (class 0 OID 16885)
-- Dependencies: 218
-- Data for Name: program; Type: TABLE DATA;
-- Schema: timetable; Owner: postgres
--

```

```

INSERT INTO timetable.program (program_id,
program_name, program_code, subdivision_id)
VALUES (1, 'Прикладная информатика',
'09.03.03', 4);
INSERT INTO timetable.program (program_id,
program_name, program_code, subdivision_id)
VALUES (2, 'Программная инженерия в
дизайне', '09.03.04', 4);
INSERT INTO timetable.program (program_id,
program_name, program_code, subdivision_id)
VALUES (3, 'Нейротехнологии', '09.03.04', 4);

```

```

--
-- TOC entry 3417 (class 0 OID 16888)
-- Dependencies: 219
-- Data for Name: subdivision; Type: TABLE DATA;
-- Schema: timetable; Owner: postgres
--

```

```

INSERT INTO timetable.subdivision (subdivision_id,
subdivision_name, subdivision_abbreviation)
VALUES (1, 'Иностранные языки', 'ИЯ');
INSERT INTO timetable.subdivision (subdivision_id,
subdivision_name, subdivision_abbreviation)
VALUES (2, 'Фундаментальные дисциплины',

```

```

'ФД');
INSERT INTO timetable.subdivision (subdivision_id,
subdivision_name, subdivision_abbreviation)
VALUES (3, 'Цифровая культура', 'ЦК');
INSERT INTO timetable.subdivision (subdivision_id,
subdivision_name, subdivision_abbreviation)
VALUES (4, 'Компьютерные технологии', 'КТ');

```

```

--
-- TOC entry 3418 (class 0 OID 16891)
-- Dependencies: 220
-- Data for Name: teacher; Type: TABLE DATA;
-- Schema: timetable; Owner: postgres
--

```

```

INSERT INTO timetable.teacher (teacher_id,
teacher_surname, teacher_name,
teacher_patronymic, position_id,
teacher_staffnumber) VALUES (1, 'Иванов',
'Иван', 'Иванович', 1, '31243543');
INSERT INTO timetable.teacher (teacher_id,
teacher_surname, teacher_name,
teacher_patronymic, position_id,
teacher_staffnumber) VALUES (2, 'Петров',
'Петр', NULL, 3, '34572355');
INSERT INTO timetable.teacher (teacher_id,
teacher_surname, teacher_name,
teacher_patronymic, position_id,
teacher_staffnumber) VALUES (3, 'Боброва',
'Мария', 'Борисовна', 4, '78726487');

```

```

--
-- TOC entry 3204 (class 2606 OID 16894)
-- Name: audience_audience_audience_capacity_check;
-- Type: CHECK CONSTRAINT; Schema: timetable;
-- Owner: postgres
--

```

```

ALTER TABLE timetable.audience
ADD CONSTRAINT
audience_audience_capacity_check CHECK
(((audience_capacity > 0) AND (audience_capacity
< 500))) NOT VALID;

```

```

--
-- TOC entry 3209 (class 2606 OID 16896)
-- Name: audience
-- audience_office_id audience_number_key; Type:
-- CONSTRAINT; Schema: timetable; Owner:
-- postgres
--

```

```

ALTER TABLE ONLY timetable.audience
ADD CONSTRAINT
audience_office_id_audience_number_key
UNIQUE (office_id, audience_number);

```

```

--
-- TOC entry 3211 (class 2606 OID 16898)
-- Name: audience_audience_pkey; Type:
-- CONSTRAINT; Schema: timetable; Owner:
-- postgres
--

```

```

ALTER TABLE ONLY timetable.audience
ADD CONSTRAINT audience_pkey PRIMARY
KEY (audience_id);

```

```

--
-- TOC entry 3213 (class 2606 OID 16900)
-- Name: audiencetype
   audiencetype_audiencetype_name_key; Type:
   CONSTRAINT; Schema: timetable; Owner:
   postgres
--
ALTER TABLE ONLY timetable.audiencetype
ADD CONSTRAINT
   audiencetype_audiencetype_name_key UNIQUE
   (audiencetype_name);

--
-- TOC entry 3215 (class 2606 OID 16902)
-- Name: audiencetype audiencetype_pkey; Type:
   CONSTRAINT; Schema: timetable; Owner:
   postgres
--
ALTER TABLE ONLY timetable.audiencetype
ADD CONSTRAINT audiencetype_pkey
   PRIMARY KEY (audiencetype_id);

--
-- TOC entry 3217 (class 2606 OID 16904)
-- Name: class
   class_audience_id_class_date_class_start_key;
   Type: CONSTRAINT; Schema: timetable; Owner:
   postgres
--
ALTER TABLE ONLY timetable.class
ADD CONSTRAINT
   class_audience_id_class_date_class_start_key
   UNIQUE (audience_id, class_date, class_start);

--
-- TOC entry 3205 (class 2606 OID 16905)
-- Name: class class_check; Type: CHECK
   CONSTRAINT; Schema: timetable; Owner:
   postgres
--
ALTER TABLE timetable.class
ADD CONSTRAINT class_check CHECK
   ((class_start < class_end)) NOT VALID;

--
-- TOC entry 3219 (class 2606 OID 16907)
-- Name: class
   class_group_id_class_date_class_start_key; Type:
   CONSTRAINT; Schema: timetable; Owner:
   postgres
--
ALTER TABLE ONLY timetable.class
ADD CONSTRAINT
   class_group_id_class_date_class_start_key
   UNIQUE (group_id, class_date, class_start);

--
-- TOC entry 3221 (class 2606 OID 16909)
-- Name: class class_pkey; Type: CONSTRAINT;
   Schema: timetable; Owner: postgres
--
ALTER TABLE ONLY timetable.class

```

```

ADD CONSTRAINT class_pkey PRIMARY KEY
   (class_id);

--
-- TOC entry 3223 (class 2606 OID 16911)
-- Name: class
   class_teacher_id_class_date_class_start_key; Type:
   CONSTRAINT; Schema: timetable; Owner:
   postgres
--
ALTER TABLE ONLY timetable.class
ADD CONSTRAINT
   class_teacher_id_class_date_class_start_key
   UNIQUE (teacher_id, class_date, class_start);

--
-- TOC entry 3225 (class 2606 OID 16913)
-- Name: classtype classtype_classtype_name_key;
   Type: CONSTRAINT; Schema: timetable; Owner:
   postgres
--
ALTER TABLE ONLY timetable.classtype
ADD CONSTRAINT
   classtype_classtype_name_key UNIQUE
   (classtype_name);

--
-- TOC entry 3227 (class 2606 OID 16915)
-- Name: classtype classtype_pkey; Type:
   CONSTRAINT; Schema: timetable; Owner:
   postgres
--
ALTER TABLE ONLY timetable.classtype
ADD CONSTRAINT classtype_pkey PRIMARY
   KEY (classtype_id);

--
-- TOC entry 3206 (class 2606 OID 16916)
-- Name: discipline discipline_check; Type: CHECK
   CONSTRAINT; Schema: timetable; Owner:
   postgres
--
ALTER TABLE timetable.discipline
ADD CONSTRAINT discipline_check CHECK
   (((((hours_lecture + hours_lab) + hours_practice) >
   0) AND (((hours_lecture + hours_lab) +
   hours_practice) < 80))) NOT VALID;

--
-- TOC entry 3229 (class 2606 OID 16918)
-- Name: discipline discipline_discipline_name_key;
   Type: CONSTRAINT; Schema: timetable; Owner:
   postgres
--
ALTER TABLE ONLY timetable.discipline
ADD CONSTRAINT
   discipline_discipline_name_key UNIQUE
   (discipline_name);

--
-- TOC entry 3231 (class 2606 OID 16920)
-- Name: discipline discipline_pkey; Type:

```

```

CONSTRAINT; Schema: timetable; Owner:
postgres
--
ALTER TABLE ONLY timetable.discipline
ADD CONSTRAINT discipline_pkey PRIMARY
KEY (discipline_id);

--
-- TOC entry 3233 (class 2606 OID 16922)
-- Name: group
group_group_code_group_yearstart key; Type:
CONSTRAINT; Schema: timetable; Owner:
postgres
--
ALTER TABLE ONLY timetable."group"
ADD CONSTRAINT
group_group_code_group_yearstart_key UNIQUE
(group_code, group_yearstart);

--
-- TOC entry 3235 (class 2606 OID 16924)
-- Name: group_group_pkey; Type: CONSTRAINT;
Schema: timetable; Owner: postgres
--
ALTER TABLE ONLY timetable."group"
ADD CONSTRAINT group_pkey PRIMARY KEY
(group_id);

--
-- TOC entry 3237 (class 2606 OID 16926)
-- Name: office_office_pkey; Type: CONSTRAINT;
Schema: timetable; Owner: postgres
--
ALTER TABLE ONLY timetable.office
ADD CONSTRAINT office_pkey PRIMARY KEY
(office_id);

--
-- TOC entry 3241 (class 2606 OID 16928)
-- Name: position_position_pkey; Type:
CONSTRAINT; Schema: timetable; Owner:
postgres
--
ALTER TABLE ONLY timetable."position"
ADD CONSTRAINT position_pkey PRIMARY
KEY (position_id);

--
-- TOC entry 3243 (class 2606 OID 16930)
-- Name: position_position_position_name_key; Type:
CONSTRAINT; Schema: timetable; Owner:
postgres
--
ALTER TABLE ONLY timetable."position"
ADD CONSTRAINT position_position_name_key
UNIQUE (position_name);

--
-- TOC entry 3245 (class 2606 OID 16932)
-- Name: program_program_pkey; Type:
CONSTRAINT; Schema: timetable; Owner:

```

```

postgres
--
ALTER TABLE ONLY timetable.program
ADD CONSTRAINT program_pkey PRIMARY
KEY (program_id);

--
-- TOC entry 3207 (class 2606 OID 16933)
-- Name: program_program_program_code_check;
Type: CHECK CONSTRAINT; Schema: timetable;
Owner: postgres
--
ALTER TABLE timetable.program
ADD CONSTRAINT
program_program_code_check CHECK
((program_code ~ '____.::text')) NOT VALID;

--
-- TOC entry 3247 (class 2606 OID 16935)
-- Name: program
program_program_name_program_code key;
Type: CONSTRAINT; Schema: timetable; Owner:
postgres
--
ALTER TABLE ONLY timetable.program
ADD CONSTRAINT
program_program_name_program_code_key
UNIQUE (program_name, program_code);

--
-- TOC entry 3249 (class 2606 OID 16937)
-- Name: subdivision_subdivision_pkey; Type:
CONSTRAINT; Schema: timetable; Owner:
postgres
--
ALTER TABLE ONLY timetable.subdivision
ADD CONSTRAINT subdivision_pkey PRIMARY
KEY (subdivision_id);

--
-- TOC entry 3251 (class 2606 OID 16939)
-- Name: subdivision
subdivision_subdivision_abbreviation_key; Type:
CONSTRAINT; Schema: timetable; Owner:
postgres
--
ALTER TABLE ONLY timetable.subdivision
ADD CONSTRAINT
subdivision_subdivision_abbreviation_key
UNIQUE (subdivision_abbreviation);

--
-- TOC entry 3253 (class 2606 OID 16941)
-- Name: subdivision
subdivision_subdivision_name_key; Type:
CONSTRAINT; Schema: timetable; Owner:
postgres
--
ALTER TABLE ONLY timetable.subdivision
ADD CONSTRAINT
subdivision_subdivision_name_key UNIQUE
(subdivision_name);

```



```

--
-- TOC entry 3255 (class 2606 OID 16943)
-- Name: teacher teacher_pkey; Type: CONSTRAINT;
-- Schema: timetable; Owner: postgres
--
ALTER TABLE ONLY timetable.teacher
ADD CONSTRAINT teacher_pkey PRIMARY
KEY (teacher_id);

--
-- TOC entry 3257 (class 2606 OID 16945)
-- Name: teacher teacher_teacher_staffnumber_key;
-- Type: CONSTRAINT; Schema: timetable; Owner:
-- postgres
--
ALTER TABLE ONLY timetable.teacher
ADD CONSTRAINT
teacher_teacher_staffnumber_key UNIQUE
(teacher_staffnumber);

--
-- TOC entry 3239 (class 2606 OID 16947)
-- Name: office unique office address; Type:
-- CONSTRAINT; Schema: timetable; Owner:
-- postgres
--
ALTER TABLE ONLY timetable.office
ADD CONSTRAINT "unique office address"
UNIQUE (office_address);

--
-- TOC entry 3258 (class 2606 OID 16948)
-- Name: audience audience_audiencetype_id_fkey;
-- Type: FK CONSTRAINT; Schema: timetable;
-- Owner: postgres
--
ALTER TABLE ONLY timetable.audience
ADD CONSTRAINT
audience_audiencetype_id_fkey FOREIGN KEY
(audiencetype_id) REFERENCES
timetable.audiencetype(audiencetype_id) ON
UPDATE RESTRICT ON DELETE RESTRICT
NOT VALID;

--
-- TOC entry 3259 (class 2606 OID 16953)
-- Name: audience audience_office_id_fkey; Type: FK
-- CONSTRAINT; Schema: timetable; Owner:
-- postgres
--
ALTER TABLE ONLY timetable.audience
ADD CONSTRAINT audience_office_id_fkey
FOREIGN KEY (office_id) REFERENCES
timetable.office(office_id) ON UPDATE
RESTRICT ON DELETE RESTRICT NOT
VALID;

--
-- TOC entry 3260 (class 2606 OID 16958)
-- Name: class class_audience_id_fkey; Type: FK
-- CONSTRAINT; Schema: timetable; Owner:

```

```

postgres
--
ALTER TABLE ONLY timetable.class
ADD CONSTRAINT class_audience_id_fkey
FOREIGN KEY (audience_id) REFERENCES
timetable.audience(audience_id) ON UPDATE
RESTRICT ON DELETE RESTRICT NOT
VALID;

--
-- TOC entry 3261 (class 2606 OID 16963)
-- Name: class class_classtype_id_fkey; Type: FK
-- CONSTRAINT; Schema: timetable; Owner:
-- postgres
--
ALTER TABLE ONLY timetable.class
ADD CONSTRAINT class_classtype_id_fkey
FOREIGN KEY (classtype_id) REFERENCES
timetable.classtype(classtype_id) ON UPDATE
RESTRICT ON DELETE RESTRICT NOT
VALID;

--
-- TOC entry 3262 (class 2606 OID 16968)
-- Name: class class_discipline_id_fkey; Type: FK
-- CONSTRAINT; Schema: timetable; Owner:
-- postgres
--
ALTER TABLE ONLY timetable.class
ADD CONSTRAINT class_discipline_id_fkey
FOREIGN KEY (discipline_id) REFERENCES
timetable.discipline(discipline_id) ON UPDATE
RESTRICT ON DELETE RESTRICT NOT
VALID;

--
-- TOC entry 3263 (class 2606 OID 16973)
-- Name: class class_group_id_fkey; Type: FK
-- CONSTRAINT; Schema: timetable; Owner:
-- postgres
--
ALTER TABLE ONLY timetable.class
ADD CONSTRAINT class_group_id_fkey
FOREIGN KEY (group_id) REFERENCES
timetable."group"(group_id) ON UPDATE
RESTRICT ON DELETE RESTRICT NOT
VALID;

--
-- TOC entry 3264 (class 2606 OID 16978)
-- Name: class class_teacher_id_fkey; Type: FK
-- CONSTRAINT; Schema: timetable; Owner:
-- postgres
--
ALTER TABLE ONLY timetable.class
ADD CONSTRAINT class_teacher_id_fkey
FOREIGN KEY (teacher_id) REFERENCES
timetable.teacher(teacher_id) ON UPDATE
RESTRICT ON DELETE RESTRICT NOT
VALID;

--
-- TOC entry 3265 (class 2606 OID 16983)

```

```
-- Name: discipline discipline_implementer_id_fkey;
    Type: FK CONSTRAINT; Schema: timetable; Owner:
    postgres
--
ALTER TABLE ONLY timetable.discipline
    ADD CONSTRAINT
        discipline_implementer_id_fkey FOREIGN KEY
        (implementer_id) REFERENCES
        timetable.subdivision(subdivision_id) ON
        UPDATE RESTRICT ON DELETE RESTRICT
        NOT VALID;

--
-- TOC entry 3266 (class 2606 OID 16988)
-- Name: group group_program_id_fkey; Type: FK
    CONSTRAINT; Schema: timetable; Owner:
    postgres
--
ALTER TABLE ONLY timetable."group"
    ADD CONSTRAINT group_program_id_fkey
        FOREIGN KEY (program_id) REFERENCES
        timetable.program(program_id) ON UPDATE
        RESTRICT ON DELETE RESTRICT;

--
-- TOC entry 3267 (class 2606 OID 16993)
-- Name: program program_subdivision_id_fkey; Type:
    FK CONSTRAINT; Schema: timetable; Owner:
    postgres
--
ALTER TABLE ONLY timetable.program
    ADD CONSTRAINT program_subdivision_id_fkey
        FOREIGN KEY (subdivision_id) REFERENCES
        timetable.subdivision(subdivision_id) ON
        UPDATE RESTRICT ON DELETE RESTRICT;

--
-- TOC entry 3268 (class 2606 OID 16998)
-- Name: teacher teacher_position_id_fkey; Type: FK
    CONSTRAINT; Schema: timetable; Owner:
    postgres
--
ALTER TABLE ONLY timetable.teacher
    ADD CONSTRAINT teacher_position_id_fkey
        FOREIGN KEY (position_id) REFERENCES
        timetable."position"(position_id) ON UPDATE
        RESTRICT ON DELETE RESTRICT NOT
        VALID;

-- Completed on 2022-03-03 12:45:43

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

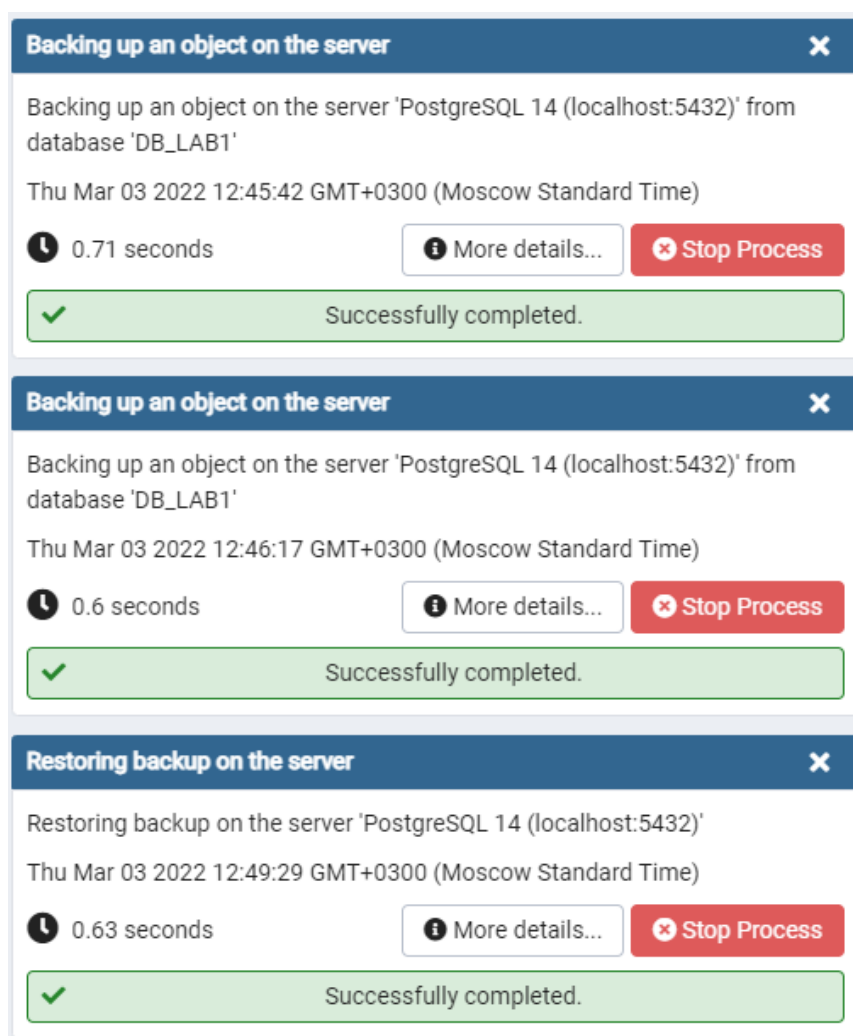


Рисунок 4 - Бэкап и восстановление

Схема базы данных представлена ниже.

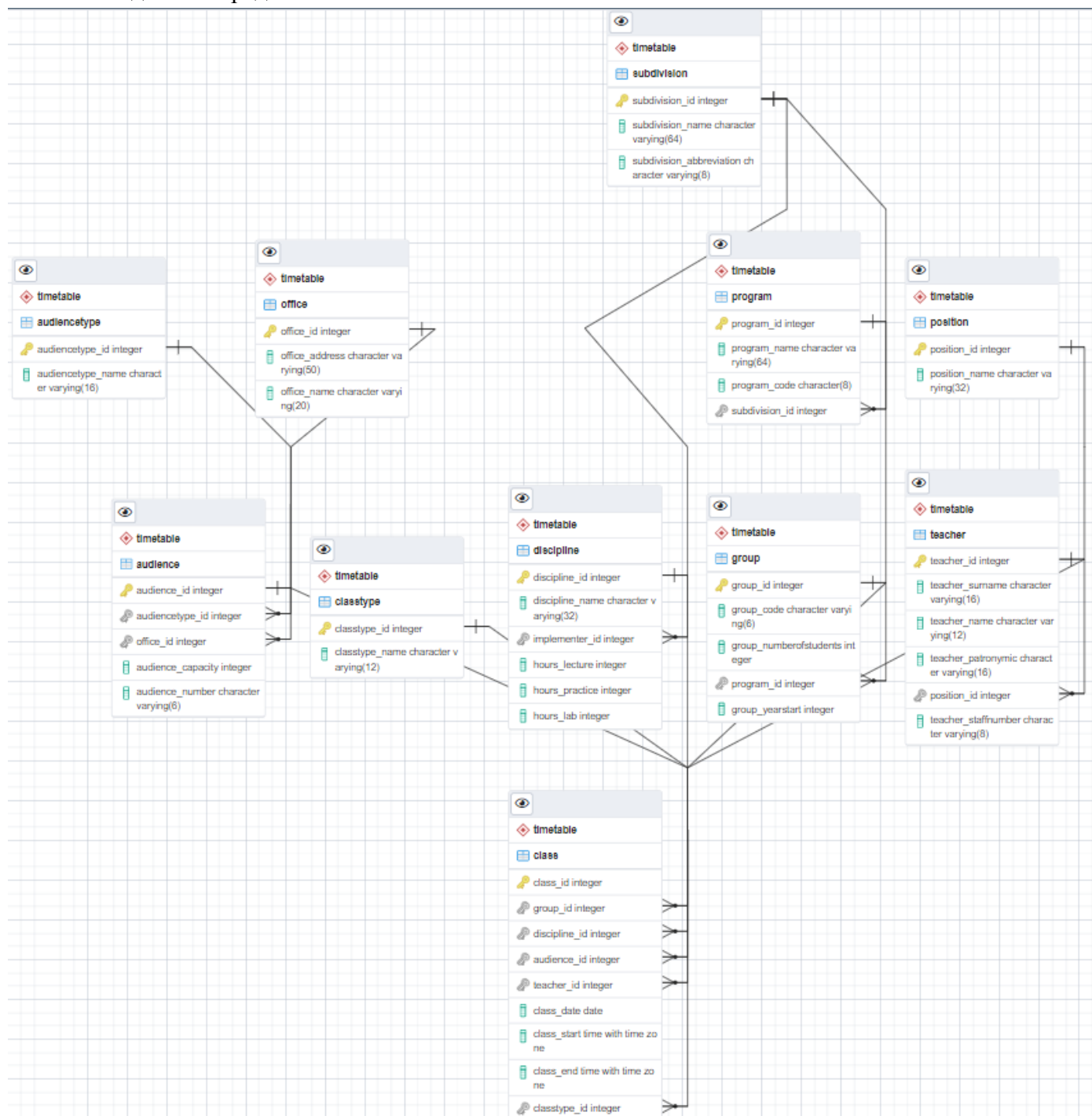


Рисунок 5 - схема базы данных

Вывод

В ходе выполнения работы была создана база данных в PostgreSQL, созданы таблицы и ограничения на значение столбцов, в базу данных были занесены рабочие данные, а также была создана логическая модель базы данных и dump. Программа pgAdmin позволяет создавать базы данных: либо напрямую посредством взаимодействия с ее GUI, или же через работу на встроенном генераторе ER диаграмм.