Отчет

по лабораторной работе «Создание таблиц базы данных PostgreSQL. Заполнение таблиц рабочими данными» по дисциплине «ПРОЕКТИРОВАНИЕ И РЕАЛИЗАЦИЯ БАЗ ДАННЫХ»

Автор: Черкес Артур Викторович

Факультет: Инфокоммуникационных технологий (ИКТ)

Группа: К33391

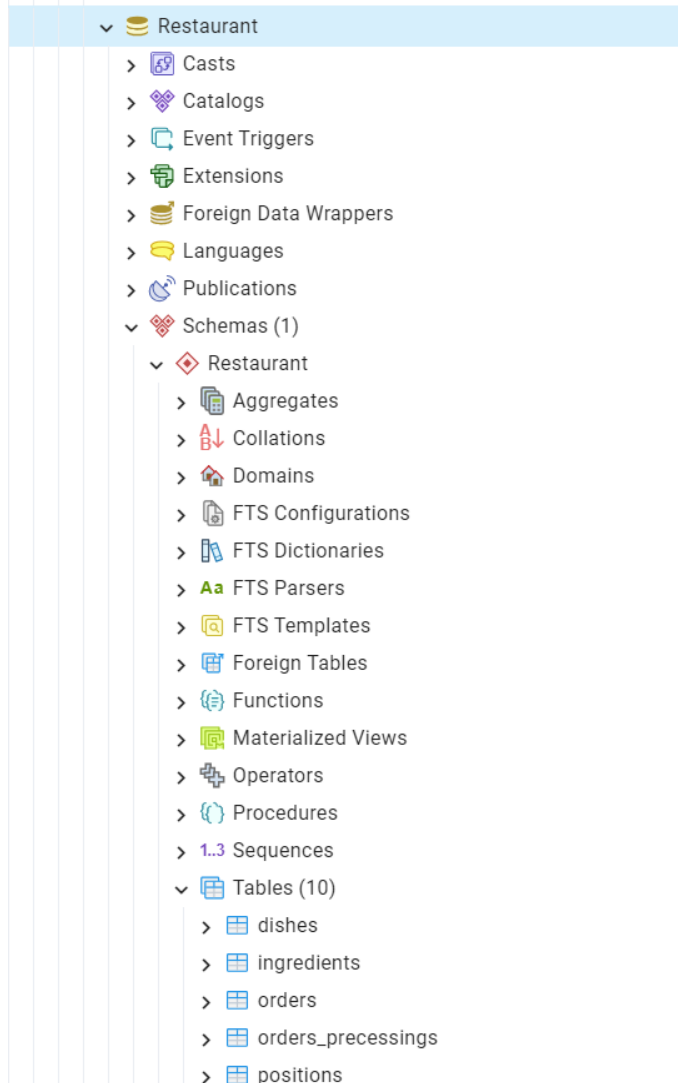Преподаватель: Говорова М. М.

Дата: 22.09.2023

ИТМО

Санкт-Петербург 2023

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

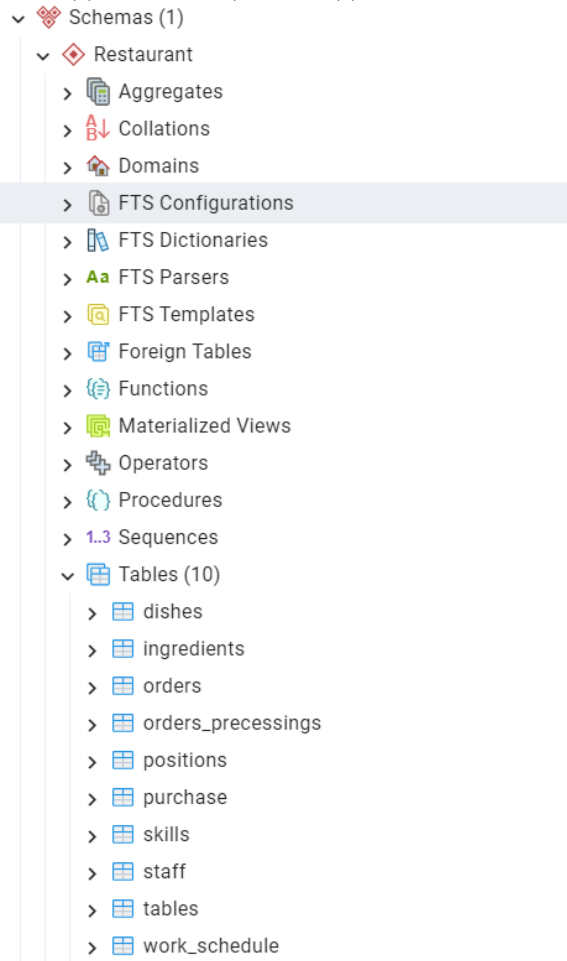**Программное обеспечение:** СУБД PostgreSQL 1X, pgAdmin 4.

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.

- Schemas (1)
  - Restaurant
    - Aggregates
    - Collations
    - Domains
    - FTS Configurations
    - FTS Dictionaries
    - FTS Parsers
    - FTS Templates
    - Foreign Tables
    - Functions
    - Materialized Views
    - Operators
    - Procedures
    - 1..3 Sequences
    - Tables (10)
      - dishes
      - ingredients
      - orders
      - orders_precessings
      - positions
      - purchase
      - skills
      - staff
      - tables
      - work_schedule

4 Установить ограничения на данные: *Primary Key, Unique, Check, Foreign Key.*

```
CREATE TABLE IF NOT EXISTS "Restaurant".dishes
(
    id bigint NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 9223372036854775807 CACHE 1
    staff_personnel_number bigint,
    recipe character varying(32000) COLLATE pg_catalog."default",
    name character varying(60) COLLATE pg_catalog."default",
    type character varying(30) COLLATE pg_catalog."default",
    ingredients_id bigint,
    CONSTRAINT dishes_pkey PRIMARY KEY (id),
    CONSTRAINT ingredients_fkey FOREIGN KEY (ingredients_id)
        REFERENCES "Restaurant".ingredients (id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
        NOT VALID,
    CONSTRAINT stuff_personal_number_fkey FOREIGN KEY (staff_personnel_number)
        REFERENCES "Restaurant".staff (personnel_id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
        NOT VALID
)

TABLESPACE pg_default;

ALTER TABLE IF EXISTS "Restaurant".dishes
    OWNER to postgres;
```

```sql
CREATE TABLE IF NOT EXISTS "Restaurant".ingredients
(
    id bigint NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 9223372036854775807 CACHE 1
    "expiration_date " date,
    product_type character varying(30) COLLATE pg_catalog."default",
    name character varying(60) COLLATE pg_catalog."default",
    calories_100g bigint,
    stock_quantity character varying(20) COLLATE pg_catalog."default",
    minimum character varying(20) COLLATE pg_catalog."default",
    CONSTRAINT ingredients_pkey PRIMARY KEY (id)
)

TABLESPACE pg_default;

ALTER TABLE IF EXISTS "Restaurant".ingredients
    OWNER to postgres;

CREATE TABLE IF NOT EXISTS "Restaurant".orders
(
    id bigint NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 9223372036854775807 CACHE 1
    date date,
    status character varying(20) COLLATE pg_catalog."default",
    payment_state character varying(20) COLLATE pg_catalog."default",
    table_id bigint,
    CONSTRAINT orders_pkey PRIMARY KEY (id),
    CONSTRAINT table_id_fkey FOREIGN KEY (table_id)
        REFERENCES "Restaurant".tables (id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
)

TABLESPACE pg_default;

ALTER TABLE IF EXISTS "Restaurant".orders
    OWNER to postgres;

CREATE TABLE IF NOT EXISTS "Restaurant".orders_precessings
(
    orders_id bigint NOT NULL,
    staff_personnel_id bigint,
    dishes_id bigint,
    dishes_amount bigint,
    notes character varying(100) COLLATE pg_catalog."default",
    CONSTRAINT dishes_fkey FOREIGN KEY (dishes_id)
        REFERENCES "Restaurant".dishes (id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
        NOT VALID,
    CONSTRAINT orders_fkey FOREIGN KEY (orders_id)
        REFERENCES "Restaurant".orders (id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
        NOT VALID,
    CONSTRAINT staff_personnel_id_fkey FOREIGN KEY (staff_personnel_id)
        REFERENCES "Restaurant".staff (personnel_id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
        NOT VALID
)

TABLESPACE pg_default;

ALTER TABLE IF EXISTS "Restaurant".orders_precessings
    OWNER to postgres;

CREATE TABLE IF NOT EXISTS "Restaurant".positions
(
    id bigint NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 9223372036854775807 CACHE 1
    salary bigint,
    working_rates numeric(2,0),
    name character varying(50) COLLATE pg_catalog."default",
    CONSTRAINT positions_pkey PRIMARY KEY (id)
)

TABLESPACE pg_default;

ALTER TABLE IF EXISTS "Restaurant".positions
    OWNER to postgres;
```

```sql
CREATE TABLE IF NOT EXISTS "Restaurant".purchase
(
    id bigint NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 9223372036854775807 CACHE 1
    date date,
    amount bigint,
    provider character varying(50) COLLATE pg_catalog."default",
    ingredients_id bigint,
    price bigint,
    CONSTRAINT purchase_pkey PRIMARY KEY (id),
    CONSTRAINT ingredients_fkey FOREIGN KEY (ingredients_id)
        REFERENCES "Restaurant".ingredients (id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
        NOT VALID
)

TABLESPACE pg_default;

ALTER TABLE IF EXISTS "Restaurant".purchase
    OWNER to postgres;

CREATE TABLE IF NOT EXISTS "Restaurant".skills
(
    stuff_key bigint,
    dishes_key bigint,
    CONSTRAINT dishes_fkey FOREIGN KEY (dishes_key)
        REFERENCES "Restaurant".dishes (id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION,
    CONSTRAINT stuff_personnel_number_fkey FOREIGN KEY (stuff_key)
        REFERENCES "Restaurant".staff (personnel_id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
)

TABLESPACE pg_default;

ALTER TABLE IF EXISTS "Restaurant".skills
    OWNER to postgres;

CREATE TABLE IF NOT EXISTS "Restaurant".staff
(
    full_name character varying(80) COLLATE pg_catalog."default",
    passport_id bigint,
    category character varying(40) COLLATE pg_catalog."default",
    personnel_id bigint NOT NULL GENERATED BY DEFAULT AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 9223372036854
    positions_id bigint,
    CONSTRAINT stuff_pkey PRIMARY KEY (personnel_id),
    CONSTRAINT positions_fkey FOREIGN KEY (positions_id)
        REFERENCES "Restaurant".positions (id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
        NOT VALID
)

TABLESPACE pg_default;

ALTER TABLE IF EXISTS "Restaurant".staff
    OWNER to postgres;

CREATE TABLE IF NOT EXISTS "Restaurant".tables
(
    id bigint NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 9223372036854775807 CACHE 1
    employment_status character varying(12) COLLATE pg_catalog."default",
    booking_date date,
    people_amount bigint,
    CONSTRAINT tables_pkey PRIMARY KEY (id)
)

TABLESPACE pg_default;

ALTER TABLE IF EXISTS "Restaurant".tables
    OWNER to postgres;
```

```
CREATE TABLE IF NOT EXISTS "Restaurant".work_schedule
(
    table_id bigint,
    staff_personnel_id bigint,
    work_status character varying(20) COLLATE pg_catalog."default",
    shift character varying(20) COLLATE pg_catalog."default",
    CONSTRAINT staff_personnel_number_fkey FOREIGN KEY (staff_personnel_id)
        REFERENCES "Restaurant".staff (personnel_id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
        NOT VALID,
    CONSTRAINT table_number_fkey FOREIGN KEY (table_id)
        REFERENCES "Restaurant".tables (id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
        NOT VALID
)

TABLESPACE pg_default;

ALTER TABLE IF EXISTS "Restaurant".work_schedule
    OWNER to postgres;
```

5 Заполнить таблицы БД рабочими данными:

Restaurant.dishes/Restaurant/postgres@PostgreSQL 15

No limit

Query   Query History

Scratch P

```
1  SELECT * FROM "Restaurant".dishes
2  ORDER BY id ASC
```

Data Output   Messages   Notifications

	id [PK] bigint	staff_personnel_id bigint	recipe character varying (32000)	name character varying (60)	type character varying (30)	ingredients_id bigint
1	3	2	Smth	Борщ	Основное	1
2	4	3	Что-то из фруктов	Фруктовый салат	Салат	2
3	5	4	Гречка	Гречка	Гарнир	3

```
1  SELECT * FROM "Restaurant".staff
2  ORDER BY personnel_id ASC
```

Data Output   Messages   Notifications

	full_name character varying (80)	passport_id bigint	category character varying (40)	personnel_id [PK] bigint	positions_id bigint
1	Ideal Idealov	666666	Third	2	3
2	Irina Pavlovna	123456	Second	3	2
3	Cherkes Arthur	123123	First	4	1

6 Создать резервную копию БД.

7 Восстановить БД

			PID	Type	Server	Object	Start Time ˅	Status	Time Taken (sec)
	⊗	🖹	13388	Backup Obje...	PostgreSQL 15 (localhost:54...	Restaurant	22.09.2023, 15:54:29	Finished	0.17
	⊗	🖹	11076	Restore	PostgreSQL 15 (localhost:54...	New_db	22.09.2023, 15:54:01	Finished	0.13
	⊗	🖹	11116	Backup Obje...	PostgreSQL 15 (localhost:54...	Restaurant	22.09.2023, 15:53:10	Finished	0.29

- Servers (1)
  - PostgreSQL 15
    - Databases (4)
      - New_db
      - Restaurant
      - postgres
      - student
    - Login/Group Roles
    - Tablespaces

Схема логической модели базы данных, сгенерированная в Generate ERD: