Министерство науки и высшего образования Российской Федерации
ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ АВТОНОМНОЕ ОБРАЗОВАТЕЛЬНОЕ
УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ
НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ ИТМО

ОТЧЕТ

ПО ЛАБОРАТОРНОЙ РАБОТЕ № 3

«СОЗДАНИЕ ТАБЛИЦ БАЗЫ ДАННЫХ POSTGRESQL. ЗАПОЛНЕНИЕ ТАБЛИЦ РАБОЧИМИ ДАННЫМИ»

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.

- С расширением CUSTOM для восстановления БД;
- с расширением PLAIN для листинга (в отчете);

Вариант 8. БД «Аэропорт» (допустимо к выполнению для команды из 2-х студентов)

Описание предметной области: Необходимо обеспечить продажу билетов на нужный рейс, при отсутствии билетов (необходимого количества билетов) предложить билет на ближайший рейс.

Рейсы выполняются по расписанию. Но есть рейсы назначаемые на определенный период или разовые.

Рейс может иметь несколько транзитных посадок (до 3-х).

На каждый рейс формируется экипаж из сотрудников компании, выполняющей рейс. В состав экипажа входят первый и второй пилоты, крю (старший стюард) и стюарды. Необходимо хранить данные о прохождении медосмотра перед рейсом (дата, статус, причина недопуска).

Билет может быть приобретен в кассе или онлайн. К базовой стоимости билета может быть дополнительная плата за выбор места, страховку багажа и т.п. Если билет приобретен в кассе, необходимо знать, в какой. Для каждой

кассы известны номер и адрес. Кассы могут располагаться в различных населенных пунктах.

При покупке билета номер места может быть неизвестен пассажиру до регистрации на рейс.

БД должна содержать следующий минимальный набор сведений: Бортовой номер самолета. Тип самолета. Количество мест. Страна. Производитель. Грузоподъемность. Скорость. Дата выпуска. Налѐт в часах. Дата последнего ремонта. Назначение самолета. Расход топлива. Код экипажа. Паспортные данные членов экипажа. Номер рейса. Дата вылета. Время вылета. Аэропорт вылета. Аэропорт назначения. Расстояние. Транзитные посадки (прилет, вылет, аэропорт, время в аэропорту). ФИО пассажира. Паспортные данные. Номер места. Тип места. Цена билета. Касса продажи билета (возможен электронный билет) (номер и адрес).

Ход работы

Название создаваемой БД - **“Аэропорт”**.

Ниже описан **состав реквизитов сущностей**.

1. CREW (**crew_id**, *member_id*, role, medical_check_datetime, medical_status, medical_reason, *flight_id*)
2. CREW_MEMBERS (**member_id**, *company_id*, full_name, passport_serial, passport_number, passport_region, role)
3. COMPANY (**company_id**, name, country)
4. PLANES (**plane_id**, *model_id*, status, flight_hours, *company_id*, last_maintenance_datetime)
5. PLANE_MODELS (**model_id**, title, engines, fuel_consumption, speed, flight_range, cargo_capacity, seats, seat_count)
6. FLIGHTS (**flight_id**, *plane_id*, *route_id*, *crew_id*, status, *departure_airport*, *destination_airport*, distance, departure_datetime_real, arrival_datetime_real)
7. SCHEDULE (**route_id**, *departure_airport*, *destination_airport*, departure_datetime, arrival_datetime)
8. AIRPORTS (**airport_code**, country, status, city, name)
9. TICKETS (**ticket_id**, *flight_id*, *passenger_id*, *seat_id*, sale_channel, *cash_register_id*, additional_fee, status)
10. PASSENGERS (**passenger_id**, full_name, passport_serial, passport_number, passport_region, birth_date)
11. SEATS (**seat_id**, *flight_id*, seat_number, seat_type, base_price, status)
12. CASH_REGISTERS (**cash_register_id**, address, status)
13. TRANST_FACT (**transit_fact_id**, *transit_id*, *flight_id*, departure_datetime_fact)
14. TRANSIT_STOPS (**transit_id**, *airport_id*, arrival_datetime, departure_datetime)

На рис. 2 изображена схема инфологической модели данных БД в нотации IDEF1X.

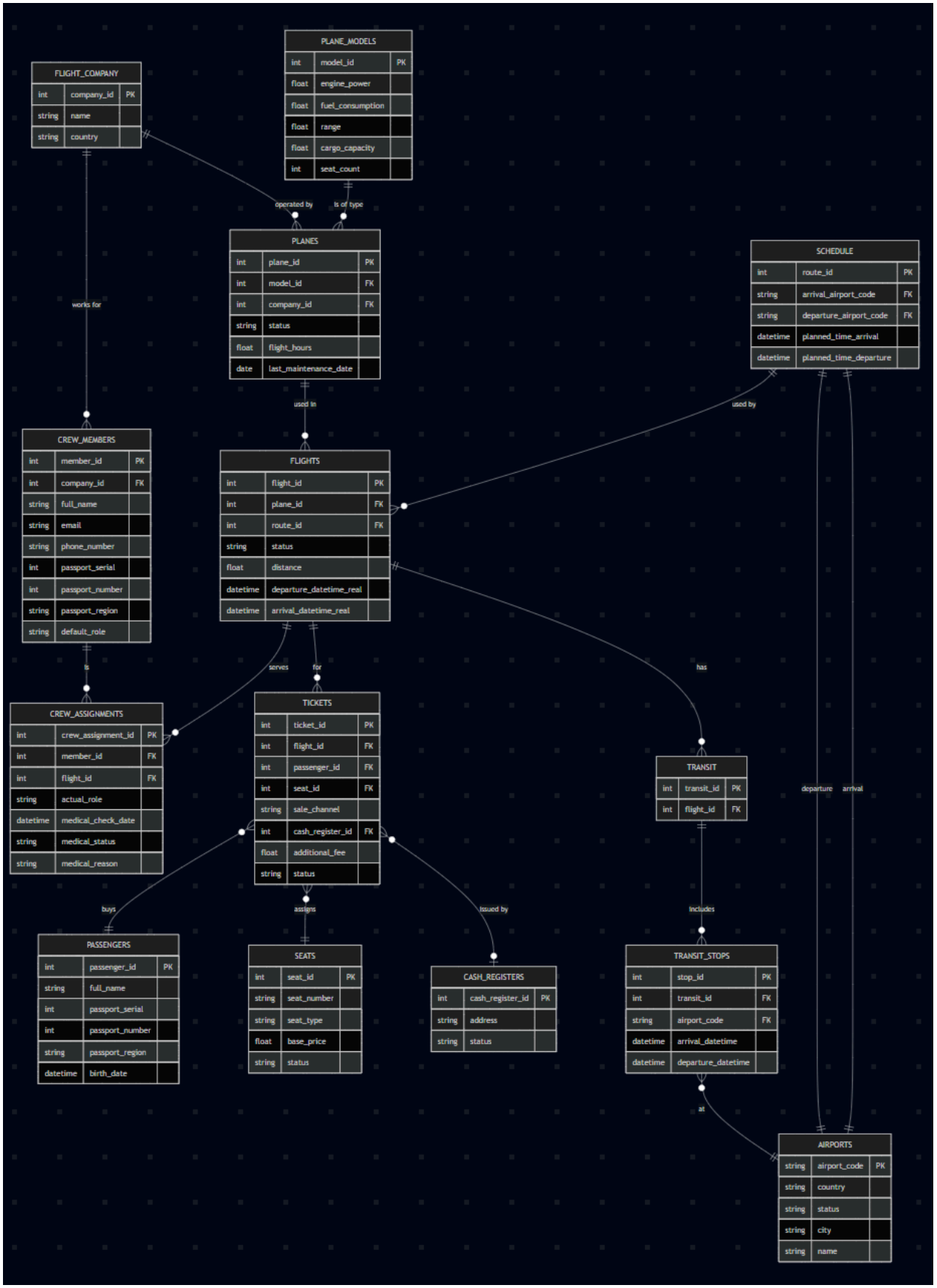

Рис. 2 - схема инфологической модели данных БД в нотации IDEF1X

На рис. 3 изображена схема логической модели базы данных, сгенерированная в Generate ERD

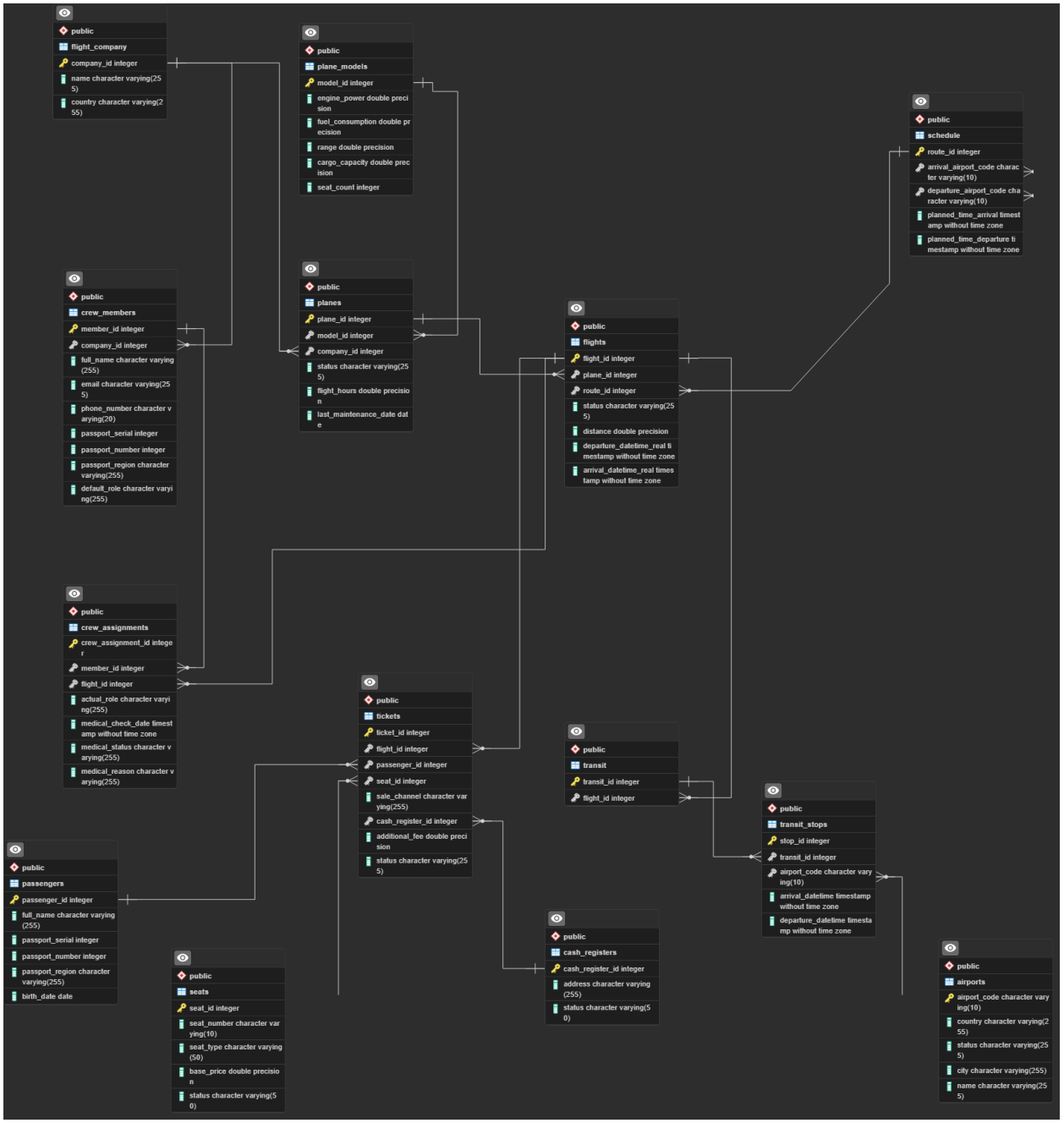

Рис. 3 - схема логической модели базы данных, сгенерированная в Generate ERD

Далее привожу dump plain для бд:

--

-- PostgreSQL database dump

```
--

-- Dumped from database version 15.4
-- Dumped by pg_dump version 15.4

-- Started on 2025-04-09 12:56:13

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 6 (class 2615 OID 17779)
-- Name: public; Type: SCHEMA; Schema: -; Owner: postgres
--

-- *not* creating schema, since initdb creates it


ALTER SCHEMA public OWNER TO postgres;

--
-- TOC entry 3469 (class 0 OID 0)
-- Dependencies: 6
```

-- Name: SCHEMA public; Type: COMMENT; Schema: -; Owner: postgres
--

COMMENT ON SCHEMA public IS '';

--
-- TOC entry 2 (class 3079 OID 16384)
-- Name: adminpack; Type: EXTENSION; Schema: -; Owner: -
--

CREATE EXTENSION IF NOT EXISTS adminpack WITH SCHEMA pg_catalog;

--
-- TOC entry 3471 (class 0 OID 0)
-- Dependencies: 2
-- Name: EXTENSION adminpack; Type: COMMENT; Schema: -; Owner:
--

COMMENT ON EXTENSION adminpack IS 'administrative functions for PostgreSQL';

SET default_tablespace = '';

SET default_table_access_method = heap;

--
-- TOC entry 221 (class 1259 OID 17960)

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

CREATE TABLE public.airports (
    airport_code character varying(10) NOT NULL,
    country character varying(255),
    status character varying(255),
    city character varying(255),
    name character varying(255)
);


ALTER TABLE public.airports OWNER TO postgres;

--
-- TOC entry 235 (class 1259 OID 18051)
-- Name: cash_registers; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.cash_registers (
    cash_register_id integer NOT NULL,
    address character varying(255),
    status character varying(50)
);


ALTER TABLE public.cash_registers OWNER TO postgres;

--
-- TOC entry 234 (class 1259 OID 18050)
```

-- Name: cash_registers_cash_register_id_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--

CREATE SEQUENCE public.cash_registers_cash_register_id_seq
    AS integer
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    NO MAXVALUE
    CACHE 1;

ALTER TABLE public.cash_registers_cash_register_id_seq OWNER TO postgres;

--
-- TOC entry 3472 (class 0 OID 0)
-- Dependencies: 234
-- Name: cash_registers_cash_register_id_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres
--

ALTER SEQUENCE public.cash_registers_cash_register_id_seq OWNED BY public.cash_registers.cash_register_id;

--
-- TOC entry 229 (class 1259 OID 18016)
-- Name: crew_assignments; Type: TABLE; Schema: public; Owner: postgres
--

```
CREATE TABLE public.crew_assignments (
    crew_assignment_id integer NOT NULL,
    member_id integer,
    flight_id integer,
    actual_role character varying(255),
    medical_check_date timestamp without time zone,
    medical_status character varying(255),
    medical_reason character varying(255)
);


ALTER TABLE public.crew_assignments OWNER TO postgres;

--
-- TOC entry 228 (class 1259 OID 18015)
-- Name: crew_assignments_crew_assignment_id_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--

CREATE SEQUENCE public.crew_assignments_crew_assignment_id_seq
    AS integer
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    NO MAXVALUE
    CACHE 1;


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

--

-- TOC entry 3473 (class 0 OID 0)

-- Dependencies: 228

-- Name: crew_assignments_crew_assignment_id_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres

--

ALTER SEQUENCE public.crew_assignments_crew_assignment_id_seq OWNED BY public.crew_assignments.crew_assignment_id;

--

-- TOC entry 227 (class 1259 OID 18002)

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

--

CREATE TABLE public.crew_members (

    member_id integer NOT NULL,

    company_id integer,

    full_name character varying(255),

    email character varying(255),

    phone_number character varying(20),

    passport_serial integer,

    passport_number integer,

    passport_region character varying(255),

    default_role character varying(255)

);

ALTER TABLE public.crew_members OWNER TO postgres;

```
--
-- TOC entry 226 (class 1259 OID 18001)
-- Name: crew_members_member_id_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--

CREATE SEQUENCE public.crew_members_member_id_seq
    AS integer
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    NO MAXVALUE
    CACHE 1;


ALTER TABLE public.crew_members_member_id_seq OWNER TO postgres;

--
-- TOC entry 3474 (class 0 OID 0)
-- Dependencies: 226
-- Name: crew_members_member_id_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres
--

ALTER SEQUENCE public.crew_members_member_id_seq OWNED BY public.crew_members.member_id;


--
-- TOC entry 216 (class 1259 OID 17928)
-- Name: flight_company; Type: TABLE; Schema: public; Owner: postgres
```

```
--

CREATE TABLE public.flight_company (
    company_id integer NOT NULL,
    name character varying(255),
    country character varying(255)
);


ALTER TABLE public.flight_company OWNER TO postgres;

--
-- TOC entry 215 (class 1259 OID 17927)
-- Name: flight_company_company_id_seq; Type: SEQUENCE; Schema: public;
Owner: postgres
--

CREATE SEQUENCE public.flight_company_company_id_seq
    AS integer
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    NO MAXVALUE
    CACHE 1;


ALTER TABLE public.flight_company_company_id_seq OWNER TO postgres;

--
-- TOC entry 3475 (class 0 OID 0)
-- Dependencies: 215
```

```
-- Name: flight_company_company_id_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres
--

ALTER SEQUENCE public.flight_company_company_id_seq OWNED BY public.flight_company.company_id;



--
-- TOC entry 225 (class 1259 OID 17985)
-- Name: flights; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.flights (
    flight_id integer NOT NULL,
    plane_id integer,
    route_id integer,
    status character varying(255),
    distance double precision,
    departure_datetime_real timestamp without time zone,
    arrival_datetime_real timestamp without time zone
);


ALTER TABLE public.flights OWNER TO postgres;

--
-- TOC entry 224 (class 1259 OID 17984)
-- Name: flights_flight_id_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--
```

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


ALTER TABLE public.flights_flight_id_seq OWNER TO postgres;

--
-- TOC entry 3476 (class 0 OID 0)
-- Dependencies: 224
-- Name: flights_flight_id_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres
--

ALTER SEQUENCE public.flights_flight_id_seq OWNED BY public.flights.flight_id;


--
-- TOC entry 231 (class 1259 OID 18035)
-- Name: passengers; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.passengers (
    passenger_id integer NOT NULL,
    full_name character varying(255),
```

```
    passport_serial integer,
    passport_number integer,
    passport_region character varying(255),
    birth_date date
);


ALTER TABLE public.passengers OWNER TO postgres;

--
-- TOC entry 230 (class 1259 OID 18034)
-- Name: passengers_passenger_id_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--

CREATE SEQUENCE public.passengers_passenger_id_seq
    AS integer
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    NO MAXVALUE
    CACHE 1;


ALTER TABLE public.passengers_passenger_id_seq OWNER TO postgres;

--
-- TOC entry 3477 (class 0 OID 0)
-- Dependencies: 230
-- Name: passengers_passenger_id_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres
```

```
--

ALTER SEQUENCE public.passengers_passenger_id_seq OWNED BY public.passengers.passenger_id;


--
-- TOC entry 218 (class 1259 OID 17937)
-- Name: plane_models; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.plane_models (
    model_id integer NOT NULL,
    engine_power double precision,
    fuel_consumption double precision,
    range double precision,
    cargo_capacity double precision,
    seat_count integer
);


ALTER TABLE public.plane_models OWNER TO postgres;

--
-- TOC entry 217 (class 1259 OID 17936)
-- Name: plane_models_model_id_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--

CREATE SEQUENCE public.plane_models_model_id_seq
    AS integer
```

```
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    NO MAXVALUE
    CACHE 1;


ALTER TABLE public.plane_models_model_id_seq OWNER TO postgres;

--
-- TOC entry 3478 (class 0 OID 0)
-- Dependencies: 217
-- Name: plane_models_model_id_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres
--

ALTER SEQUENCE public.plane_models_model_id_seq OWNED BY public.plane_models.model_id;


--
-- TOC entry 220 (class 1259 OID 17944)
-- Name: planes; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.planes (
    plane_id integer NOT NULL,
    model_id integer,
    company_id integer,
    status character varying(255),
    flight_hours double precision,
```

```
    last_maintenance_date date
);


ALTER TABLE public.planes OWNER TO postgres;

--
-- TOC entry 219 (class 1259 OID 17943)
-- Name: planes_plane_id_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--

CREATE SEQUENCE public.planes_plane_id_seq
    AS integer
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    NO MAXVALUE
    CACHE 1;


ALTER TABLE public.planes_plane_id_seq OWNER TO postgres;

--
-- TOC entry 3479 (class 0 OID 0)
-- Dependencies: 219
-- Name: planes_plane_id_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres
--
```

```
ALTER SEQUENCE public.planes_plane_id_seq OWNED BY public.planes.plane_id;


--
-- TOC entry 223 (class 1259 OID 17968)
-- Name: schedule; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.schedule (
    route_id integer NOT NULL,
    arrival_airport_code character varying(10),
    departure_airport_code character varying(10),
    planned_time_arrival timestamp without time zone,
    planned_time_departure timestamp without time zone
);


ALTER TABLE public.schedule OWNER TO postgres;

--
-- TOC entry 222 (class 1259 OID 17967)
-- Name: schedule_route_id_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--

CREATE SEQUENCE public.schedule_route_id_seq
    AS integer
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
```

```
    NO MAXVALUE
    CACHE 1;


ALTER TABLE public.schedule_route_id_seq OWNER TO postgres;

--
-- TOC entry 3480 (class 0 OID 0)
-- Dependencies: 222
-- Name: schedule_route_id_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres
--

ALTER SEQUENCE public.schedule_route_id_seq OWNED BY public.schedule.route_id;


--
-- TOC entry 233 (class 1259 OID 18044)
-- Name: seats; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.seats (
    seat_id integer NOT NULL,
    seat_number character varying(10),
    seat_type character varying(50),
    base_price double precision,
    status character varying(50)
);
```

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

--
-- TOC entry 232 (class 1259 OID 18043)
-- Name: seats_seat_id_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--

CREATE SEQUENCE public.seats_seat_id_seq
    AS integer
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    NO MAXVALUE
    CACHE 1;


ALTER TABLE public.seats_seat_id_seq OWNER TO postgres;

--
-- TOC entry 3481 (class 0 OID 0)
-- Dependencies: 232
-- Name: seats_seat_id_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres
--

ALTER SEQUENCE public.seats_seat_id_seq OWNED BY public.seats.seat_id;


--
-- TOC entry 237 (class 1259 OID 18058)
-- Name: tickets; Type: TABLE; Schema: public; Owner: postgres
```

```
--

CREATE TABLE public.tickets (
    ticket_id integer NOT NULL,
    flight_id integer,
    passenger_id integer,
    seat_id integer,
    sale_channel character varying(255),
    cash_register_id integer,
    additional_fee double precision,
    status character varying(255)
);


ALTER TABLE public.tickets OWNER TO postgres;

--
-- TOC entry 236 (class 1259 OID 18057)
-- Name: tickets_ticket_id_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--

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

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

--
-- TOC entry 3482 (class 0 OID 0)
-- Dependencies: 236
-- Name: tickets_ticket_id_seq; Type: SEQUENCE OWNED BY; Schema: public;
Owner: postgres
--

ALTER SEQUENCE public.tickets_ticket_id_seq OWNED BY
public.tickets.ticket_id;



--
-- TOC entry 239 (class 1259 OID 18087)
-- Name: transit; Type: TABLE; Schema: public; Owner: postgres
--

CREATE TABLE public.transit (
    transit_id integer NOT NULL,
    flight_id integer
);


ALTER TABLE public.transit OWNER TO postgres;

--
-- TOC entry 241 (class 1259 OID 18099)
-- Name: transit_stops; Type: TABLE; Schema: public; Owner: postgres
--
```

```
CREATE TABLE public.transit_stops (
    stop_id integer NOT NULL,
    transit_id integer,
    airport_code character varying(10),
    arrival_datetime timestamp without time zone,
    departure_datetime timestamp without time zone
);


ALTER TABLE public.transit_stops OWNER TO postgres;

--
-- TOC entry 240 (class 1259 OID 18098)
-- Name: transit_stops_stop_id_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--

CREATE SEQUENCE public.transit_stops_stop_id_seq
    AS integer
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    NO MAXVALUE
    CACHE 1;


ALTER TABLE public.transit_stops_stop_id_seq OWNER TO postgres;

--
-- TOC entry 3483 (class 0 OID 0)
-- Dependencies: 240
```

-- Name: transit_stops_stop_id_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres
--

ALTER SEQUENCE public.transit_stops_stop_id_seq OWNED BY public.transit_stops.stop_id;

--
-- TOC entry 238 (class 1259 OID 18086)
-- Name: transit_transit_id_seq; Type: SEQUENCE; Schema: public; Owner: postgres
--

CREATE SEQUENCE public.transit_transit_id_seq
    AS integer
    START WITH 1
    INCREMENT BY 1
    NO MINVALUE
    NO MAXVALUE
    CACHE 1;

ALTER TABLE public.transit_transit_id_seq OWNER TO postgres;

--
-- TOC entry 3484 (class 0 OID 0)
-- Dependencies: 238
-- Name: transit_transit_id_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres
--

ALTER SEQUENCE public.transit_transit_id_seq OWNED BY public.transit.transit_id;

--
-- TOC entry 3247 (class 2604 OID 18054)
-- Name: cash_registers cash_register_id; Type: DEFAULT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.cash_registers ALTER COLUMN cash_register_id SET DEFAULT nextval('public.cash_registers_cash_register_id_seq'::regclass);

--
-- TOC entry 3244 (class 2604 OID 18019)
-- Name: crew_assignments crew_assignment_id; Type: DEFAULT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.crew_assignments ALTER COLUMN crew_assignment_id SET DEFAULT nextval('public.crew_assignments_crew_assignment_id_seq'::regclass);

--
-- TOC entry 3243 (class 2604 OID 18005)
-- Name: crew_members member_id; Type: DEFAULT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.crew_members ALTER COLUMN member_id SET DEFAULT nextval('public.crew_members_member_id_seq'::regclass);

--
-- TOC entry 3238 (class 2604 OID 17931)
-- Name: flight_company company_id; Type: DEFAULT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.flight_company ALTER COLUMN company_id SET DEFAULT nextval('public.flight_company_company_id_seq'::regclass);

--
-- TOC entry 3242 (class 2604 OID 17988)
-- Name: flights flight_id; Type: DEFAULT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.flights ALTER COLUMN flight_id SET DEFAULT nextval('public.flights_flight_id_seq'::regclass);

--
-- TOC entry 3245 (class 2604 OID 18038)
-- Name: passengers passenger_id; Type: DEFAULT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.passengers ALTER COLUMN passenger_id SET DEFAULT nextval('public.passengers_passenger_id_seq'::regclass);

--
-- TOC entry 3239 (class 2604 OID 17940)
-- Name: plane_models model_id; Type: DEFAULT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.plane_models ALTER COLUMN model_id SET DEFAULT nextval('public.plane_models_model_id_seq'::regclass);

--
-- TOC entry 3240 (class 2604 OID 17947)
-- Name: planes plane_id; Type: DEFAULT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.planes ALTER COLUMN plane_id SET DEFAULT nextval('public.planes_plane_id_seq'::regclass);

--
-- TOC entry 3241 (class 2604 OID 17971)
-- Name: schedule route_id; Type: DEFAULT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.schedule ALTER COLUMN route_id SET DEFAULT nextval('public.schedule_route_id_seq'::regclass);

--

-- TOC entry 3246 (class 2604 OID 18047)

-- Name: seats seat_id; Type: DEFAULT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.seats ALTER COLUMN seat_id SET DEFAULT nextval('public.seats_seat_id_seq'::regclass);

--

-- TOC entry 3248 (class 2604 OID 18061)

-- Name: tickets ticket_id; Type: DEFAULT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.tickets ALTER COLUMN ticket_id SET DEFAULT nextval('public.tickets_ticket_id_seq'::regclass);

--

-- TOC entry 3249 (class 2604 OID 18090)

-- Name: transit transit_id; Type: DEFAULT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.transit ALTER COLUMN transit_id SET DEFAULT nextval('public.transit_transit_id_seq'::regclass);

--

-- TOC entry 3250 (class 2604 OID 18102)

-- Name: transit_stops stop_id; Type: DEFAULT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.transit_stops ALTER COLUMN stop_id SET DEFAULT nextval('public.transit_stops_stop_id_seq'::regclass);

--
-- TOC entry 3443 (class 0 OID 17960)
-- Dependencies: 221
-- Data for Name: airports; Type: TABLE DATA; Schema: public; Owner: postgres
--

COPY public.airports (airport_code, country, status, city, name) FROM stdin;
LED	Russia	Active	St. Petersburg	Pulkovo
JFK	USA	Active	New York	John F. Kennedy
\.

--
-- TOC entry 3457 (class 0 OID 18051)
-- Dependencies: 235
-- Data for Name: cash_registers; Type: TABLE DATA; Schema: public; Owner: postgres
--

COPY public.cash_registers (cash_register_id, address, status) FROM stdin;
\.

--

-- TOC entry 3451 (class 0 OID 18016)

-- Dependencies: 229

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

--

COPY public.crew_assignments (crew_assignment_id, member_id, flight_id, actual_role, medical_check_date, medical_status, medical_reason) FROM stdin;

\.

--

-- TOC entry 3449 (class 0 OID 18002)

-- Dependencies: 227

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

--

COPY public.crew_members (member_id, company_id, full_name, email, phone_number, passport_serial, passport_number, passport_region, default_role) FROM stdin;

\.

--

-- TOC entry 3438 (class 0 OID 17928)

-- Dependencies: 216

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

--

COPY public.flight_company (company_id, name, country) FROM stdin;
1	Airline 1	Russia
2	Airline 2	USA
\.

--
-- TOC entry 3447 (class 0 OID 17985)
-- Dependencies: 225
-- Data for Name: flights; Type: TABLE DATA; Schema: public; Owner: postgres
--

COPY public.flights (flight_id, plane_id, route_id, status, distance, departure_datetime_real, arrival_datetime_real) FROM stdin;
\.

--
-- TOC entry 3453 (class 0 OID 18035)
-- Dependencies: 231
-- Data for Name: passengers; Type: TABLE DATA; Schema: public; Owner: postgres
--

COPY public.passengers (passenger_id, full_name, passport_serial, passport_number, passport_region, birth_date) FROM stdin;
\.

--

-- TOC entry 3440 (class 0 OID 17937)

-- Dependencies: 218

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

--

COPY public.plane_models (model_id, engine_power, fuel_consumption, range, cargo_capacity, seat_count) FROM stdin;

1 3000 250 5000 20000 150

2 4000 300 7000 25000 200

\.

--

-- TOC entry 3442 (class 0 OID 17944)

-- Dependencies: 220

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

--

COPY public.planes (plane_id, model_id, company_id, status, flight_hours, last_maintenance_date) FROM stdin;

1 1 1 Operational 1200 2025-01-01

2 2 2 Maintenance 800 2024-12-15

\.

--

-- TOC entry 3445 (class 0 OID 17968)

-- Dependencies: 223

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

--

COPY public.schedule (route_id, arrival_airport_code, departure_airport_code, planned_time_arrival, planned_time_departure) FROM stdin;

\.

--

-- TOC entry 3455 (class 0 OID 18044)

-- Dependencies: 233

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

--

COPY public.seats (seat_id, seat_number, seat_type, base_price, status) FROM stdin;

\.

--

-- TOC entry 3459 (class 0 OID 18058)

-- Dependencies: 237

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

--

COPY public.tickets (ticket_id, flight_id, passenger_id, seat_id, sale_channel, cash_register_id, additional_fee, status) FROM stdin;

\.

--

-- TOC entry 3461 (class 0 OID 18087)

-- Dependencies: 239

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

--

COPY public.transit (transit_id, flight_id) FROM stdin;

\.

--

-- TOC entry 3463 (class 0 OID 18099)

-- Dependencies: 241

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

--

COPY public.transit_stops (stop_id, transit_id, airport_code, arrival_datetime, departure_datetime) FROM stdin;

\.

--

-- TOC entry 3485 (class 0 OID 0)

-- Dependencies: 234

-- Name: cash_registers_cash_register_id_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg_catalog.setval('public.cash_registers_cash_register_id_seq', 1, false);

--

-- TOC entry 3486 (class 0 OID 0)

-- Dependencies: 228

-- Name: crew_assignments_crew_assignment_id_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg_catalog.setval('public.crew_assignments_crew_assignment_id_seq', 1, false);

--

-- TOC entry 3487 (class 0 OID 0)

-- Dependencies: 226

-- Name: crew_members_member_id_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg_catalog.setval('public.crew_members_member_id_seq', 1, false);

--

-- TOC entry 3488 (class 0 OID 0)

-- Dependencies: 215

-- Name: flight_company_company_id_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

```
SELECT pg_catalog.setval('public.flight_company_company_id_seq', 2, true);


--
-- TOC entry 3489 (class 0 OID 0)
-- Dependencies: 224
-- Name: flights_flight_id_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres
--

SELECT pg_catalog.setval('public.flights_flight_id_seq', 1, false);


--
-- TOC entry 3490 (class 0 OID 0)
-- Dependencies: 230
-- Name: passengers_passenger_id_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres
--

SELECT pg_catalog.setval('public.passengers_passenger_id_seq', 1, false);


--
-- TOC entry 3491 (class 0 OID 0)
-- Dependencies: 217
-- Name: plane_models_model_id_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres
--

SELECT pg_catalog.setval('public.plane_models_model_id_seq', 2, true);
```

--

-- TOC entry 3492 (class 0 OID 0)

-- Dependencies: 219

-- Name: planes_plane_id_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg_catalog.setval('public.planes_plane_id_seq', 2, true);

--

-- TOC entry 3493 (class 0 OID 0)

-- Dependencies: 222

-- Name: schedule_route_id_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg_catalog.setval('public.schedule_route_id_seq', 1, false);

--

-- TOC entry 3494 (class 0 OID 0)

-- Dependencies: 232

-- Name: seats_seat_id_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg_catalog.setval('public.seats_seat_id_seq', 1, false);

--

-- TOC entry 3495 (class 0 OID 0)

-- Dependencies: 236

-- Name: tickets_ticket_id_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg_catalog.setval('public.tickets_ticket_id_seq', 1, false);

--

-- TOC entry 3496 (class 0 OID 0)

-- Dependencies: 240

-- Name: transit_stops_stop_id_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg_catalog.setval('public.transit_stops_stop_id_seq', 1, false);

--

-- TOC entry 3497 (class 0 OID 0)

-- Dependencies: 238

-- Name: transit_transit_id_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg_catalog.setval('public.transit_transit_id_seq', 1, false);

--

-- TOC entry 3258 (class 2606 OID 17966)

-- Name: airports airports_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres

--

```
ALTER TABLE ONLY public.airports
    ADD CONSTRAINT airports_pkey PRIMARY KEY (airport_code);
```

--

-- TOC entry 3272 (class 2606 OID 18056)

-- Name: cash_registers cash_registers_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres

--

```
ALTER TABLE ONLY public.cash_registers
    ADD CONSTRAINT cash_registers_pkey PRIMARY KEY (cash_register_id);
```

--

-- TOC entry 3266 (class 2606 OID 18023)

-- Name: crew_assignments crew_assignments_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres

--

```
ALTER TABLE ONLY public.crew_assignments
            ADD CONSTRAINT crew_assignments_pkey PRIMARY KEY (crew_assignment_id);
```

```
--
-- TOC entry 3264 (class 2606 OID 18009)
-- Name: crew_members crew_members_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.crew_members
    ADD CONSTRAINT crew_members_pkey PRIMARY KEY (member_id);


--
-- TOC entry 3252 (class 2606 OID 17935)
-- Name: flight_company flight_company_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.flight_company
    ADD CONSTRAINT flight_company_pkey PRIMARY KEY (company_id);


--
-- TOC entry 3262 (class 2606 OID 17990)
-- Name: flights flights_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.flights
    ADD CONSTRAINT flights_pkey PRIMARY KEY (flight_id);


--
```

```
-- TOC entry 3268 (class 2606 OID 18042)
-- Name: passengers passengers_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.passengers
    ADD CONSTRAINT passengers_pkey PRIMARY KEY (passenger_id);


--
-- TOC entry 3254 (class 2606 OID 17942)
-- Name: plane_models plane_models_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.plane_models
    ADD CONSTRAINT plane_models_pkey PRIMARY KEY (model_id);


--
-- TOC entry 3256 (class 2606 OID 17949)
-- Name: planes planes_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.planes
    ADD CONSTRAINT planes_pkey PRIMARY KEY (plane_id);


--
-- TOC entry 3260 (class 2606 OID 17973)
```

```
-- Name: schedule schedule_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.schedule
    ADD CONSTRAINT schedule_pkey PRIMARY KEY (route_id);



--
-- TOC entry 3270 (class 2606 OID 18049)
-- Name: seats seats_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.seats
    ADD CONSTRAINT seats_pkey PRIMARY KEY (seat_id);



--
-- TOC entry 3274 (class 2606 OID 18065)
-- Name: tickets tickets_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.tickets
    ADD CONSTRAINT tickets_pkey PRIMARY KEY (ticket_id);



--
-- TOC entry 3276 (class 2606 OID 18092)
```

```
-- Name: transit transit_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.transit
    ADD CONSTRAINT transit_pkey PRIMARY KEY (transit_id);



--
-- TOC entry 3278 (class 2606 OID 18104)
-- Name: transit_stops transit_stops_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.transit_stops
    ADD CONSTRAINT transit_stops_pkey PRIMARY KEY (stop_id);



--
-- TOC entry 3286 (class 2606 OID 18029)
-- Name: crew_assignments crew_assignments_flight_id_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.crew_assignments
        ADD CONSTRAINT crew_assignments_flight_id_fkey FOREIGN KEY (flight_id) REFERENCES public.flights(flight_id);



--
-- TOC entry 3287 (class 2606 OID 18024)
```

-- Name: crew_assignments crew_assignments_member_id_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.crew_assignments
    ADD CONSTRAINT crew_assignments_member_id_fkey FOREIGN KEY (member_id) REFERENCES public.crew_members(member_id);

--
-- TOC entry 3285 (class 2606 OID 18010)
-- Name: crew_members crew_members_company_id_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.crew_members
    ADD CONSTRAINT crew_members_company_id_fkey FOREIGN KEY (company_id) REFERENCES public.flight_company(company_id);

--
-- TOC entry 3283 (class 2606 OID 17991)
-- Name: flights flights_plane_id_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.flights
    ADD CONSTRAINT flights_plane_id_fkey FOREIGN KEY (plane_id) REFERENCES public.planes(plane_id);

```
--
-- TOC entry 3284 (class 2606 OID 17996)
-- Name: flights flights_route_id_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.flights
    ADD CONSTRAINT flights_route_id_fkey FOREIGN KEY (route_id) REFERENCES public.schedule(route_id);


--
-- TOC entry 3279 (class 2606 OID 17955)
-- Name: planes planes_company_id_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.planes
    ADD CONSTRAINT planes_company_id_fkey FOREIGN KEY (company_id) REFERENCES public.flight_company(company_id);


--
-- TOC entry 3280 (class 2606 OID 17950)
-- Name: planes planes_model_id_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.planes
    ADD CONSTRAINT planes_model_id_fkey FOREIGN KEY (model_id) REFERENCES public.plane_models(model_id);
```

```
--
-- TOC entry 3281 (class 2606 OID 17974)
-- Name: schedule schedule_arrival_airport_code_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.schedule
    ADD CONSTRAINT schedule_arrival_airport_code_fkey FOREIGN KEY (arrival_airport_code) REFERENCES public.airports(airport_code);


--
-- TOC entry 3282 (class 2606 OID 17979)
-- Name: schedule schedule_departure_airport_code_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.schedule
    ADD CONSTRAINT schedule_departure_airport_code_fkey FOREIGN KEY (departure_airport_code) REFERENCES public.airports(airport_code);


--
-- TOC entry 3288 (class 2606 OID 18081)
-- Name: tickets tickets_cash_register_id_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.tickets
```

```
    ADD CONSTRAINT tickets_cash_register_id_fkey FOREIGN KEY
(cash_register_id) REFERENCES public.cash_registers(cash_register_id);


--
-- TOC entry 3289 (class 2606 OID 18066)
-- Name: tickets tickets_flight_id_fkey; Type: FK CONSTRAINT; Schema: public;
Owner: postgres
--

ALTER TABLE ONLY public.tickets
    ADD CONSTRAINT tickets_flight_id_fkey FOREIGN KEY (flight_id)
REFERENCES public.flights(flight_id);


--
-- TOC entry 3290 (class 2606 OID 18071)
-- Name: tickets tickets_passenger_id_fkey; Type: FK CONSTRAINT; Schema:
public; Owner: postgres
--

ALTER TABLE ONLY public.tickets
    ADD CONSTRAINT tickets_passenger_id_fkey FOREIGN KEY
(passenger_id) REFERENCES public.passengers(passenger_id);


--
-- TOC entry 3291 (class 2606 OID 18076)
-- Name: tickets tickets_seat_id_fkey; Type: FK CONSTRAINT; Schema: public;
Owner: postgres
--
```

```
ALTER TABLE ONLY public.tickets
    ADD CONSTRAINT tickets_seat_id_fkey FOREIGN KEY (seat_id) REFERENCES public.seats(seat_id);


--
-- TOC entry 3292 (class 2606 OID 18093)
-- Name: transit transit_flight_id_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.transit
    ADD CONSTRAINT transit_flight_id_fkey FOREIGN KEY (flight_id) REFERENCES public.flights(flight_id);


--
-- TOC entry 3293 (class 2606 OID 18110)
-- Name: transit_stops transit_stops_airport_code_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY public.transit_stops
    ADD CONSTRAINT transit_stops_airport_code_fkey FOREIGN KEY (airport_code) REFERENCES public.airports(airport_code);


--
-- TOC entry 3294 (class 2606 OID 18105)
```

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

ALTER TABLE ONLY public.transit_stops
    ADD CONSTRAINT transit_stops_transit_id_fkey FOREIGN KEY (transit_id) REFERENCES public.transit(transit_id);



--
-- TOC entry 3470 (class 0 OID 0)
-- Dependencies: 6
-- Name: SCHEMA public; Type: ACL; Schema: -; Owner: postgres
--

REVOKE USAGE ON SCHEMA public FROM PUBLIC;



-- Completed on 2025-04-09 12:56:13

--
-- PostgreSQL database dump complete
--




-- ================================================
-- Create database
-- ================================================
CREATE DATABASE flight_management;
\c flight_management;
```

```
-- ============================================
-- Add comments to tables and columns
-- ============================================

-- Airports
COMMENT ON TABLE public.airports IS 'Справочник аэропортов';
COMMENT ON COLUMN public.airports.airport_code IS 'Уникальный код аэропорта (PK)';
COMMENT ON COLUMN public.airports.country IS 'Страна, где расположен аэропорт';
COMMENT ON COLUMN public.airports.city IS 'Город, где расположен аэропорт';
COMMENT ON COLUMN public.airports.status IS 'Текущий статус (действующий, закрыт и т.д.)';

-- Cash Registers
COMMENT ON TABLE public.cash_registers IS 'Кассы для продажи билетов';
COMMENT ON COLUMN public.cash_registers.cash_register_id IS 'Идентификатор кассы (PK)';
COMMENT ON COLUMN public.cash_registers.address IS 'Физический адрес кассы';
COMMENT ON COLUMN public.cash_registers.status IS 'Состояние кассы (активна, отключена)';

-- Crew Assignments
COMMENT ON TABLE public.crew_assignments IS 'Назначения экипажей на рейсы';
COMMENT ON COLUMN public.crew_assignments.member_id IS 'Ссылка на члена экипажа';
```

```
COMMENT ON COLUMN public.crew_assignments.flight_id IS 'Ссылка на рейс';
COMMENT ON COLUMN public.crew_assignments.actual_role IS 'Фактическая роль (пилот, бортпроводник и т.п.)';
COMMENT ON COLUMN public.crew_assignments.medical_check_date IS 'Дата прохождения медосмотра';
COMMENT ON COLUMN public.crew_assignments.medical_status IS 'Результат медосмотра';

-- ============================================
-- Sample data insertion
-- ============================================

-- Insert some airports
INSERT INTO public.airports (airport_code, country, status, city, name)
VALUES
  ('LED', 'Russia', 'active', 'Saint Petersburg', 'Pulkovo'),
  ('SVO', 'Russia', 'active', 'Moscow', 'Sheremetyevo'),
  ('JFK', 'USA', 'active', 'New York', 'John F. Kennedy International');

-- Insert sample cash registers
INSERT INTO public.cash_registers (cash_register_id, address, status)
VALUES
  (1, 'Terminal A, LED', 'active'),
  (2, 'Terminal B, SVO', 'active');

-- Insert sample crew assignment
INSERT INTO public.crew_assignments (crew_assignment_id, member_id, flight_id, actual_role, medical_check_date, medical_status)
VALUES
  (1, 1, 1, 'Pilot', '2025-03-01 08:00:00', 'fit');
```

Выводы

В ходе выполнения лабораторной работы была разработана и реализована база данных «Аэропорт» с использованием системы управления базами данных PostgreSQL. Работа включала в себя все этапы проектирования и реализации БД: от создания инфологической и логической модели до написания DDL-скриптов с определением таблиц, их связей и ограничений.

Основные результаты лабораторной работы:

- Создана база данных и схема на основе анализа предметной области.
- Реализованы таблицы с учетом требований варианта и нормализации данных.
- Установлены ограничения целостности:
    - **первичные ключи (Primary Key)** для идентификации записей,
    - **внешние ключи (Foreign Key)** для обеспечения связности между таблицами,
    - **уникальные ограничения (UNIQUE)** и
    - **логические ограничения (CHECK)** на допустимые значения в полях.
- Таблицы заполнены рабочими (тестовыми) данными с помощью команд `INSERT`.
- Выполнено резервное копирование базы данных в форматах `CUSTOM` (для восстановления) и `PLAIN` (для просмотра кода в отчете).
- Была построена инфологическая модель данных в нотации IDEF1X и сгенерирована ER-модель логической структуры базы данных.

В процессе работы были усвоены ключевые практические навыки создания, настройки и поддержки реляционных баз данных.

Таким образом, поставленные цели лабораторной работы достигнуты в полном объеме, что подтверждается работоспособностью созданной базы данных и корректностью реализации всех требований предметной области.