



МИНОБРНАУКИ РОССИИ

**Федеральное государственное бюджетное образовательное учреждение
высшего образования**

«МИРЭА - Российский технологический университет»

РТУ МИРЭА

**Институт перспективных технологий и индустриального программирования
(ИПТИП)**

ОТЧЕТ ПО ЛАБОРАТОРНЫМ РАБОТАМ

по дисциплине

«Базы данных и анализ промышленных данных»

Лабораторная работа №1

Выполнил студент группы ЭФМО-02-23

Мурадов Н.Н.

Москва 2023

Задача

Необходимо создать базу данных с использованием СУБД PostgreSQL и ввести новые данные.

Решение

Листинг кода:

```
CREATE DATABASE transport;
```

```
\c transport;
```

```
CREATE TABLE COUNTRY (  
    ID BIGINT PRIMARY KEY,  
    NAME CHARACTER(30) NOT NULL  
);
```

```
CREATE TABLE CITY (  
    ID BIGINT PRIMARY KEY,  
    NAME CHARACTER(30) NOT NULL,  
    COUNTRY_ID BIGINT REFERENCES COUNTRY (ID)  
);
```

```
CREATE TABLE ROUTE (  
    ID BIGINT PRIMARY KEY,  
    DEPARTURE_POINT BIGINT REFERENCES CITY (ID),  
    ARRIVAL_POINT BIGINT REFERENCES CITY (ID),  
    TRAIN_NUMBER CHARACTER(30) NOT NULL  
);
```

```
CREATE TABLE JOURNEY (  
    ID BIGINT PRIMARY KEY,  
    ROUTE_ID BIGINT REFERENCES ROUTE (ID),  
    TIME_OF_DEPARTURE timestamp NOT NULL,  
    TIME_OF_ARRIVAL timestamp NOT NULL  
);
```

```
CREATE TABLE WAY_STATION (  
    ID BIGINT PRIMARY KEY,  
    JOURNEY_ID BIGINT REFERENCES JOURNEY (ID),  
    CITY_ID BIGINT REFERENCES CITY (ID),  
    TIME_OF_DEPARTURE timestamp NOT NULL,  
    TIME_OF_ARRIVAL timestamp NOT NULL  
);
```

```
CREATE TABLE TICKET (  
    ID BIGINT PRIMARY KEY,  
    JOURNEY_ID BIGINT REFERENCES JOURNEY (ID),  
    TYPE_WAGON BIGINT NOT NULL,  
    PLACE BIGINT NOT NULL,  
    PRICE BIGINT NOT NULL,
```

STATE BIGINT NOT NULL DEFAULT 1
);

INSERT INTO COUNTRY VALUES

(0, 'россия'),
(1, 'казахстан')
RETURNING ID;

INSERT INTO CITY VALUES

(2, 'москва', 0),
(3, 'омск', 0),
(4, 'саратов', 0),
(5, 'екатеринбург', 0),
(6, 'астрахань', 0),
(7, 'павлодар', 1),
(8, 'петропавловск', 1),
(9, 'уральск', 1),
(10, 'курчатов', 1),
(11, 'усть-каменогорск', 1)
RETURNING ID;

INSERT INTO ROUTE VALUES

(12, 2, 3, '#5341'),
(13, 2, 4, '#5342'),
(14, 2, 5, '#5343'),
(15, 2, 6, '#5344'),
(16, 2, 7, '#5345'),
(17, 2, 8, '#5346'),
(18, 2, 9, '#5347'),
(19, 2, 10, '#5348'),
(20, 2, 11, '#5349'),
(21, 7, 2, '#5340')
RETURNING ID;

INSERT INTO JOURNEY VALUES

(22, 12, '2016-07-22 19:10:25', '2016-07-22 21:10:25'),
(23, 13, '2016-07-23 19:10:25', '2016-07-23 21:10:25'),
(24, 14, '2016-07-24 19:10:25', '2016-07-24 21:10:25'),
(25, 15, '2016-07-25 19:10:25', '2016-07-25 21:10:25'),
(26, 16, '2016-07-26 19:10:25', '2016-07-26 21:10:25'),
(27, 17, '2016-07-27 19:10:25', '2016-07-27 21:10:25'),
(28, 18, '2016-07-28 19:10:25', '2016-07-28 21:10:25'),
(29, 19, '2016-07-29 19:10:25', '2016-07-29 21:10:25'),
(30, 20, '2016-07-30 19:10:25', '2016-07-30 21:10:25'),
(31, 21, '2016-07-31 19:10:25', '2016-07-31 21:10:25')
RETURNING ID;

INSERT INTO WAY_STATION VALUES

(32, 22, 2, '2016-07-22 19:10:25', '2016-07-22 20:10:25'),
(33, 23, 2, '2016-07-23 19:10:25', '2016-07-23 20:10:25'),
(34, 24, 2, '2016-07-24 19:10:25', '2016-07-24 20:10:25'),
(35, 25, 2, '2016-07-25 19:10:25', '2016-07-25 20:10:25'),

(36, 26, 2, '2016-07-26 19:10:25', '2016-07-26 20:10:25'),
(37, 27, 2, '2016-07-27 19:10:25', '2016-07-27 21:10:25'),
(38, 28, 2, '2016-07-28 19:10:25', '2016-07-28 21:10:25'),
(39, 29, 2, '2016-07-29 19:10:25', '2016-07-29 21:10:25'),
(40, 30, 2, '2016-07-30 19:10:25', '2016-07-30 21:10:25'),
(41, 31, 2, '2016-07-31 19:10:25', '2016-07-31 21:10:25'),
(42, 22, 3, '2016-07-22 20:10:25', '2016-07-22 21:10:25'),
(43, 23, 4, '2016-07-23 20:10:25', '2016-07-23 21:10:25'),
(44, 24, 5, '2016-07-24 20:10:25', '2016-07-24 21:10:25'),
(45, 25, 6, '2016-07-25 20:10:25', '2016-07-25 21:10:25'),
(46, 26, 7, '2016-07-26 20:10:25', '2016-07-26 21:10:25')
RETURNING ID;

INSERT INTO TICKET VALUES

(47, 22, 1, 0, 100, 1),
(48, 23, 1, 0, 200, 1),
(49, 24, 2, 0, 300, 1),
(50, 25, 1, 0, 400, 1),
(51, 26, 1, 0, 500, 1),
(52, 27, 1, 0, 600, 1),
(53, 28, 1, 0, 700, 1),
(54, 29, 2, 0, 800, 1),
(55, 30, 1, 0, 900, 1),
(56, 31, 1, 0, 1000, 1),
(57, 22, 1, 1, 1100, 1),
(58, 23, 1, 1, 1200, 1),
(59, 24, 2, 1, 1300, 1),
(60, 25, 1, 1, 1400, 1),
(61, 26, 1, 1, 1500, 1),
(62, 22, 1, 0, 1600, 2),
(63, 23, 1, 0, 1700, 2),
(64, 24, 1, 0, 1800, 2),
(65, 25, 2, 0, 1900, 2),
(66, 26, 1, 0, 2000, 2)
RETURNING ID;

Результаты

SQL Shell (psql)		SQL Shell (psql)	
transport=# SELECT * FROM JOURNEY;		transport=# SELECT * FROM JOURNEY;	
id route_id time_of_departure time_of_arrival		id route_id time_of_departure time_of_arrival	
-----		-----	
22 12 2016-07-22 19:10:25 2016-07-22 21:10:25		22 12 2016-07-22 19:10:25 2016-07-22 21:10:25	
23 13 2016-07-23 19:10:25 2016-07-23 21:10:25		23 13 2016-07-23 19:10:25 2016-07-23 21:10:25	
24 14 2016-07-24 19:10:25 2016-07-24 21:10:25		24 14 2016-07-24 19:10:25 2016-07-24 21:10:25	
25 15 2016-07-25 19:10:25 2016-07-25 21:10:25		25 15 2016-07-25 19:10:25 2016-07-25 21:10:25	
26 16 2016-07-26 19:10:25 2016-07-26 21:10:25		26 16 2016-07-26 19:10:25 2016-07-26 21:10:25	
27 17 2016-07-27 19:10:25 2016-07-27 21:10:25		27 17 2016-07-27 19:10:25 2016-07-27 21:10:25	
28 18 2016-07-28 19:10:25 2016-07-28 21:10:25		28 18 2016-07-28 19:10:25 2016-07-28 21:10:25	
29 19 2016-07-29 19:10:25 2016-07-29 21:10:25		29 19 2016-07-29 19:10:25 2016-07-29 21:10:25	
30 20 2016-07-30 19:10:25 2016-07-30 21:10:25		30 20 2016-07-30 19:10:25 2016-07-30 21:10:25	
31 21 2016-07-31 19:10:25 2016-07-31 21:10:25		31 21 2016-07-31 19:10:25 2016-07-31 21:10:25	
(10 строк)		(10 строк)	
transport=# SELECT * FROM COUNTRY;		transport=# SELECT * FROM WAY_STATION;	
id name		id journey_id city_id time_of_departure time_of_arrival	
-----		-----	
0 россия		32 22 2 2016-07-22 19:10:25 2016-07-22 20:10:25	
1 казахстан		33 23 2 2016-07-23 19:10:25 2016-07-23 20:10:25	
(2 строки)		34 24 2 2016-07-24 19:10:25 2016-07-24 20:10:25	
transport=# SELECT * FROM CITY;		35 25 2 2016-07-25 19:10:25 2016-07-25 20:10:25	
id name country_id		36 26 2 2016-07-26 19:10:25 2016-07-26 20:10:25	
-----		37 27 2 2016-07-27 19:10:25 2016-07-27 21:10:25	
2 москва 0		38 28 2 2016-07-28 19:10:25 2016-07-28 21:10:25	
3 оск 0		39 29 2 2016-07-29 19:10:25 2016-07-29 21:10:25	
4 саратов 0		40 30 2 2016-07-30 19:10:25 2016-07-30 21:10:25	
5 екатеринбург 0		41 31 2 2016-07-31 19:10:25 2016-07-31 21:10:25	
6 астрахань 0		42 22 3 2016-07-22 20:10:25 2016-07-22 21:10:25	
7 павлодар 1		43 23 4 2016-07-23 20:10:25 2016-07-23 21:10:25	
8 петропавловск 1		44 24 5 2016-07-24 20:10:25 2016-07-24 21:10:25	
9 уральск 1		45 25 6 2016-07-25 20:10:25 2016-07-25 21:10:25	
10 курчатов 1		46 26 7 2016-07-26 20:10:25 2016-07-26 21:10:25	
11 усть-каменогорск 1		(15 строк)	
(10 строк)		transport=# SELECT * FROM TICKET;	
transport=# SELECT * FROM ROUTE;		id journey_id type_wagon place price state	
id departure_point arrival_point train_number		-----	
-----		47 22 1 0 100 1	
12 2 3 #5341		48 23 1 0 200 1	
13 2 4 #5342		49 24 2 0 300 1	
14 2 5 #5343		50 25 1 0 400 1	
15 2 6 #5344		51 26 1 0 500 1	
16 2 7 #5345		52 27 1 0 600 1	
17 2 8 #5346		53 28 1 0 700 1	
18 2 9 #5347		54 29 2 0 800 1	
19 2 10 #5348		55 30 1 0 900 1	
20 2 11 #5349		56 31 1 0 1000 1	
21 7 2 #5340		57 22 1 1 1100 1	
(10 строк)		58 23 1 1 1200 1	
transport=# SELECT * FROM JOURNEY;			