Домашнее задание №5
по “Базам даннных”
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Группы БПИ №215

Задание №1.

Наполнение базы данных library_bd:

```
INSERT INTO "Reader" (id, last_name, first_name, address, birth_date)
VALUES (1, 'Smith', 'John', '123 Main St', '1990-01-01'),
       (2, 'Johnson', 'Sarah', '456 Elm St', '1985-05-10'),
       (3, 'Garcia', 'Maria', '789 Maple Ave', '1995-11-20'),
       (4, 'Kim', 'David', '321 Oak Blvd', '1982-03-15'),
       (5, 'Lee', 'Jenny', '654 Pine St', '1998-07-25');

INSERT INTO "Book" (isbn, title, author, pages_num, year, pub_id)
VALUES (1234567, 'To Kill a Mockingbird', 'Harper Lee', 281, 1960, 1),
       (2345678, '1984', 'George Orwell', 328, 1949, 2),
       (3456789, 'Pride and Prejudice', 'Jane Austen', 279, 1813, 3),
       (4567890, 'The Great Gatsby', 'F. Scott Fitzgerald', 180, 1925, 1),
       (5678901, 'The Catcher in the Rye', 'J.D. Salinger', 224, 1951, 4);

INSERT INTO "Publisher" (id, pub_name, pub_address)
VALUES (1, 'HarperCollins Publishers', '195 Broadway, New York, NY'),
       (2, 'Secker & Warburg', '14 Carlisle St, London'),
       (3, 'T. Egerton, Military Library', 'Whitehall, London'),
       (4, 'Little, Brown and Company', '1290 Avenue of the Americas, New
York, NY'),
       (5, 'Penguin Random House', '1745 Broadway, New York, NY');

INSERT INTO "Category" (id, name)
VALUES (1, 'Fiction'),
       (2, 'Non-fiction'),
       (3, 'Mystery'),
       (4, 'Romance'),
       (5, 'Science fiction');

INSERT INTO "Copy" (id, copy_number, book_isbn, shelf_position)
VALUES (1, 1, 1234567, 1),
       (2, 2, 1234567, 2),
       (3, 1, 2345678, 3),
       (4, 1, 3456789, 4),
       (5, 1, 5678901, 5);

INSERT INTO "Borrowing" (id, reader_nr, book_copy, return_date)
VALUES (1, 1, 1, '2022-01-01'),
       (2, 2, 3, '2022-02-01'),
       (3, 3, 5, '2022-03-01'),
       (4, 4, 4, '2022-04-01'),
       (5, 5, 2, '2022-05-01');

INSERT INTO "BookCategory" (id, category_id, book_isbn)
VALUES (1, 1, 1234567),
       (2, 1, 2345678),
       (3, 4, 3456789),
       (4, 3, 5678901),
       (5, 5, 5678901);
```

После просмотра задания наполнение базы данных пришлось немного изменить дабы запросы давали хоть какой-то вывод.

	isbn	title	author	pages_num	year	pub_id
1	1234567	To Kill a Mockingbird	Harper Lee	281	1960	1
2	2345678	1984	George Orwell	328	1949	2
3	3456789	Pride and Prejudice	Jane Austen	279	1813	3
4	4567890	The Great Gatsby	F. Scott Fitzgerald	180	1925	1
5	5678901	The Catcher in the Rye	J.D. Salinger	224	1951	4

	id	category_id	book_isbn
1	1	1	1234567
2	2	1	2345678
3	3	4	3456789
4	5	2	5678901
5	4	1	5678901

	id	reader_nr	book_copy	return_date
1	1	1	1	2022-01-01
2	3	3	5	2022-03-01
3	4	4	4	2023-11-12
4	2	2	3	2023-11-09
5	5	5	4	2022-05-01

	id	name
1	3	Mystery
2	4	Romance
3	5	Science fiction
4	2	Trips
5	1	Mountains

	id	copy_number	book_isbn	shelf_position
1	1	1	1234567	1
2	2	2	1234567	2
3	3	1	2345678	3
4	4	1	3456789	4
5	5	1	5678901	5

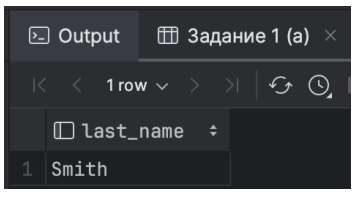
	id	pub_name	pub_address
1	1	HarperCollins Publishers	195 Broadway, New York, NY
2	2	Secker & Warburg	14 Carlisle St, London
3	3	T. Egerton, Military Library	Whitehall, London
4	4	Little, Brown and Company	1290 Avenue of the Americas, New York, NY
5	5	Penguin Random House	1745 Broadway, New York, NY

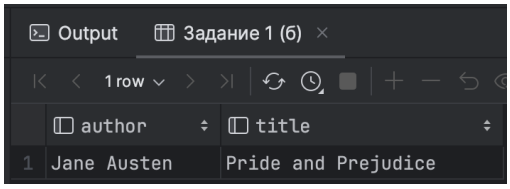
	id	last_name	first_name	address	birth_date
1	5	Lee	Jenny	654 Pine St Saint-Petersburg	1998-07-25
2	3	Garcia	Maria	789 Maple Ave Anapa	1995-11-20
3	2	Johnson	Sarah	456 Elm St Sochi	1985-05-10
4	1	Smith	John	123 Main St Moscow	1990-01-01
5	4	Ivanov	Ivan	321 Oak Blvd Ufa	1982-03-15

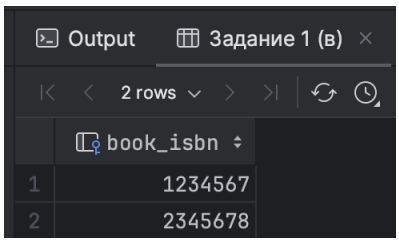
Запросы к library_bd:

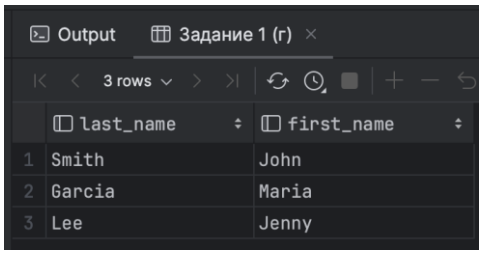
```sql
/* Задание 1 (а) */
SELECT "last_name" FROM "Reader" WHERE "address" LIKE '%Moscow%';

/* Задание 1 (б) */
SELECT author, title
FROM "Book"
JOIN "Copy" ON "Book".isbn = book_isbn
JOIN "Borrowing" ON "Copy".id = book_copy
JOIN "Reader" ON "Borrowing".reader_nr = "Reader".id
WHERE "Reader".first_name = 'Ivan' AND "Reader".last_name = 'Ivanov';

/* Задание 1 (в) */
SELECT bc.book_isbn
FROM "BookCategory" bc
JOIN "Category" c1 ON bc.category_id = c1.id
WHERE c1.name = 'Mountains'
AND bc.book_isbn NOT IN (
    SELECT bc2.book_isbn
    FROM "BookCategory" bc2
    JOIN "Category" c2 ON bc2.category_id = c2.id
    WHERE c2.name = 'Trips'
);

/* Задание 1 (г) */
SELECT r.last_name, r.first_name
FROM "Reader" r
JOIN "Borrowing" b ON r.id = b.reader_nr
WHERE b.return_date IS NOT NULL AND b.return_date < current_date;

/* Задание 1 (д) */
SELECT last_name, first_name FROM "Reader" r
    JOIN "Borrowing" br on r.id = br.reader_nr
    JOIN "Copy" cp on br.book_copy = cp.id
    WHERE cp.book_isbn
              IN (SELECT book_isbn FROM "Copy" cop1
                    JOIN "Borrowing" br1
                        on cop1.id = br1.book_copy
                    JOIN "Reader" r1
                        on br1.reader_nr = r1.id
                    WHERE r1.first_name = 'Ivan' AND r1.last_name = 'Ivanov')
    AND (r.first_name not like 'Ivan' OR r.last_name not like 'Ivanov');
```

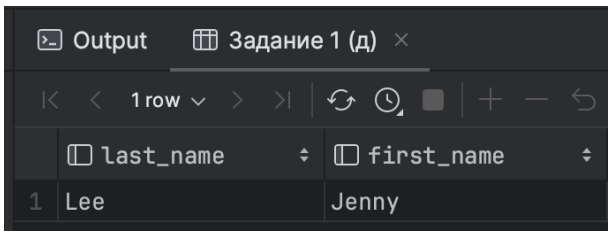
Выводы после запросов











Задание №2.

Наполнение базы данных station_db.

```
INSERT INTO "City" ("id", "region", "name") VALUES
(1, '77', 'Moscow'),
(2, '78', 'Saint Petersburg'),
(3, '69', 'Tver'),
(4, '23', 'Sochi'),
(5, '23', 'Anapa');

INSERT INTO "Station" ("name", "city_id", "tracks") VALUES
('Moscow st.', 1, 3),
('Saint Petersburg st.', 2, 2),
('Tver st.', 3, 4),
('Sochi st.', 4, 1),
('Anapa st.', 5, 2);

INSERT INTO "Train" ("train_nr", "length", "start_station_name",
"end_station_name") VALUES
(101, 10, 'Moscow st.', 'Saint Petersburg st.'),
(102, 8, 'Sochi st.', 'Anapa st.'),
(103, 12, 'Moscow st.', 'Tver st.'),
(104, 6, 'Moscow st.', 'Sochi st.'),
(105, 14, 'Saint Petersburg st.', 'Anapa st.');

INSERT INTO "Connection" ("id", "from_station", "to_station", "train_nr",
"departure", "arrival") VALUES
(1, 'Moscow st.', 'Tver st.', 101, '2021-01-01 08:00:00', '2021-01-01
09:00:00'),
(2, 'Tver st.', 'Saint Petersburg st.', 101, '2021-01-01 09:00:00', '2021-01-
01 10:00:00'),
(3, 'Moscow st.', 'Saint Petersburg st.', 101, '2021-01-01 08:00:00', '2021-
```

```
01-01 10:00:00'),
(4, 'Sochi st.', 'Anapa st.', 102, '2021-01-01 09:00:00', '2021-01-01
10:30:00'),
(5, 'Moscow st.', 'Tver st.', 103, '2021-01-01 10:30:00', '2021-01-01
12:00:00'),
(6, 'Moscow st.', 'Sochi st.', 104, '2021-01-01 11:30:00', '2021-01-01
12:30:00'),
(7, 'Saint Petersburg st.', 'Anapa st.', 105, '2021-01-01 12:00:00', '2021-
01-01 14:00:00');
```

После просмотра задания наполнение базы данных пришлось немного изменить дабы запросы давали хоть какой-то вывод.

	id	region	name
1	1	77	Moscow
2	2	78	Saint Petersburg
3	3	69	Tver
4	4	23	Sochi
5	5	23	Anapa
6	6	16	Kazan
7	7	HL	Helsinki

	id	from_station	to_station	train_nr	departure	arrival
1	1	Moscow st.	Tver st.	101	2021-01-01 08:00:00.000000	2021-01-01 09:00:00.000000
2	2	Tver st.	Saint Petersburg st.	101	2021-01-01 09:00:00.000000	2021-01-01 10:00:00.000000
3	3	Moscow st.	Saint Petersburg st.	101	2021-01-01 08:00:00.000000	2021-01-01 10:00:00.000000
4	4	Sochi st.	Anapa st.	102	2021-01-01 09:00:00.000000	2021-01-01 10:30:00.000000
5	5	Moscow st.	Tver st.	103	2021-01-01 10:30:00.000000	2021-01-01 12:00:00.000000
6	6	Moscow st.	Sochi st.	104	2021-01-01 11:30:00.000000	2021-01-01 12:30:00.000000
7	7	Saint Petersburg st.	Anapa st.	105	2021-01-01 12:00:00.000000	2021-01-01 14:00:00.000000
8	8	Moscow st.	Saint Petersburg st.	106	2023-11-02 17:02:47.000000	2023-11-03 17:02:56.000000
9	9	Anapa st.	Moscow st.	107	2023-11-04 08:04:27.000000	2023-11-04 18:04:44.000000
10	10	Moscow st.	Saint Petersburg st.	107	2023-11-04 18:05:31.000000	2023-11-06 23:05:44.000000
11	11	Anapa st.	Saint Petersburg st.	107	2023-11-04 08:04:27.000000	2023-11-06 23:05:44.000000
12	12	Kazan st.	Moscow st.	108	2023-11-05 05:08:21.000000	2023-11-06 10:08:40.000000
13	13	Moscow st.	Saint Petersburg st.	108	2023-11-06 10:10:40.000000	2023-11-06 15:08:40.000000
14	14	Saint Petersburg st.	Helsinki st.	108	2023-11-06 15:18:40.000000	2023-11-06 23:08:40.000000
15	15	Kazan st.	Helsinki st.	108	2023-11-05 05:08:21.000000	2023-11-06 23:08:40.000000

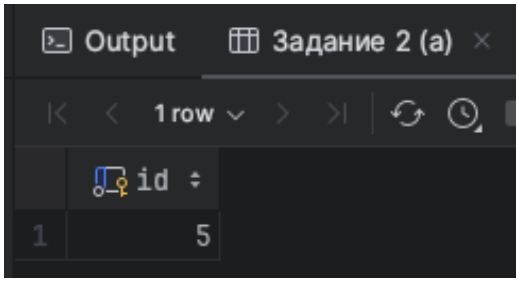
	train_nr	length	start_station_name	end_station_name
1	101	10	Moscow st.	Saint Petersburg st.
2	102	8	Sochi st.	Anapa st.
3	103	12	Moscow st.	Tver st.
4	104	6	Moscow st.	Sochi st.
5	105	14	Saint Petersburg st.	Anapa st.
6	106	10	Moscow st.	Saint Petersburg st.
7	107	8	Anapa st.	Saint Petersburg st.
8	108	12	Kazan st.	Helsinki st.

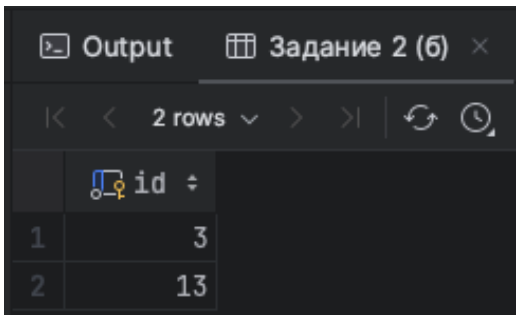
	name	city_id	tracks
1	Moscow st.	1	3
2	Saint Petersburg st.	2	2
3	Tver st.	3	4
4	Sochi st.	4	1
5	Anapa st.	5	2
6	Kazan st.	6	8
7	Helsinki st.	7	7

Запросы к базе данных station_db:

```sql
/* Задание 2 (а) */
SELECT c.id
FROM "Connection" c
JOIN "Train" t ON c.train_nr = t.train_nr
JOIN "Station" s1 ON t.start_station_name = s1.name
JOIN "Station" s2 ON t.end_station_name = s2.name
WHERE s1.name = 'Moscow st.' AND s2.name = 'Tver st.';

/* Задание 2 (б) */
SELECT c.id
FROM "Connection" c
JOIN "Train" t ON c.train_nr = t.train_nr
JOIN "Station" s1 ON c.from_station = s1.name
JOIN "Station" s2 ON c.to_station = s2.name
WHERE s1.name = 'Moscow st.' AND s2.name = 'Saint Petersburg st.' AND
DATE(c.departure) = DATE(c.arrival);
```

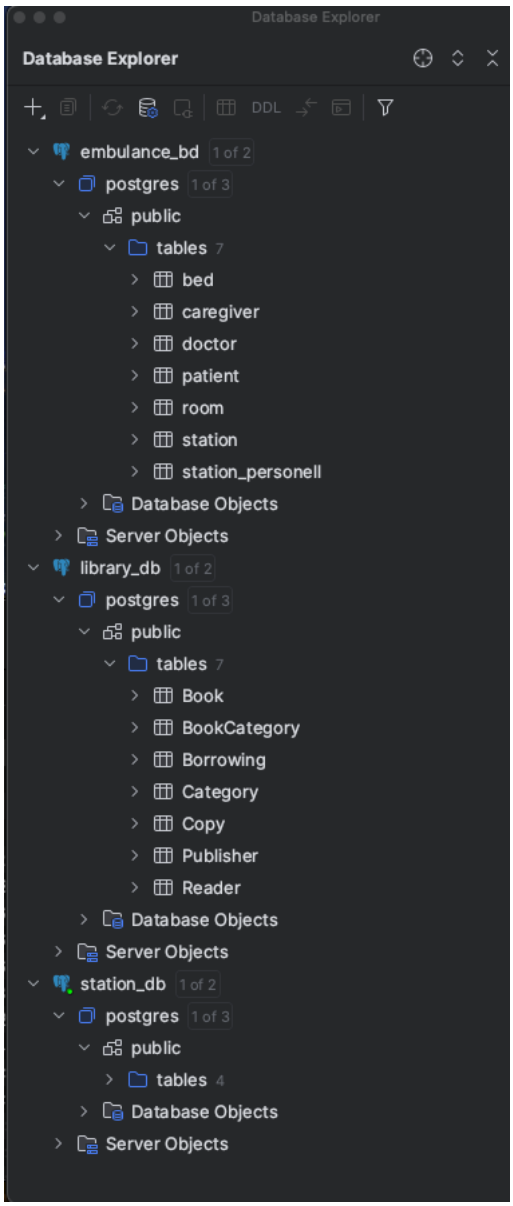
Выводы после запросов:





Что в итоге получилось в проекте:

(см. следующий лист)


Database Explorer
Database Explorer
DDL
embulance_bd 1 of 2
postgres 1 of 3
public
tables 7
bed
caregiver
doctor
patient
room
station
station_personell
Database Objects
Server Objects
library_db 1 of 2
postgres 1 of 3
public
tables 7
Book
BookCategory
Borrowing
Category
Copy
Publisher
Reader
Database Objects
Server Objects
station_db 1 of 2
postgres 1 of 3
public
tables 4
Database Objects
Server Objects