Белорусский Государственный Университет
Информатики и Радиоэлектроники
Кафедра ЭВМ

Отчет по лабораторной работе №4
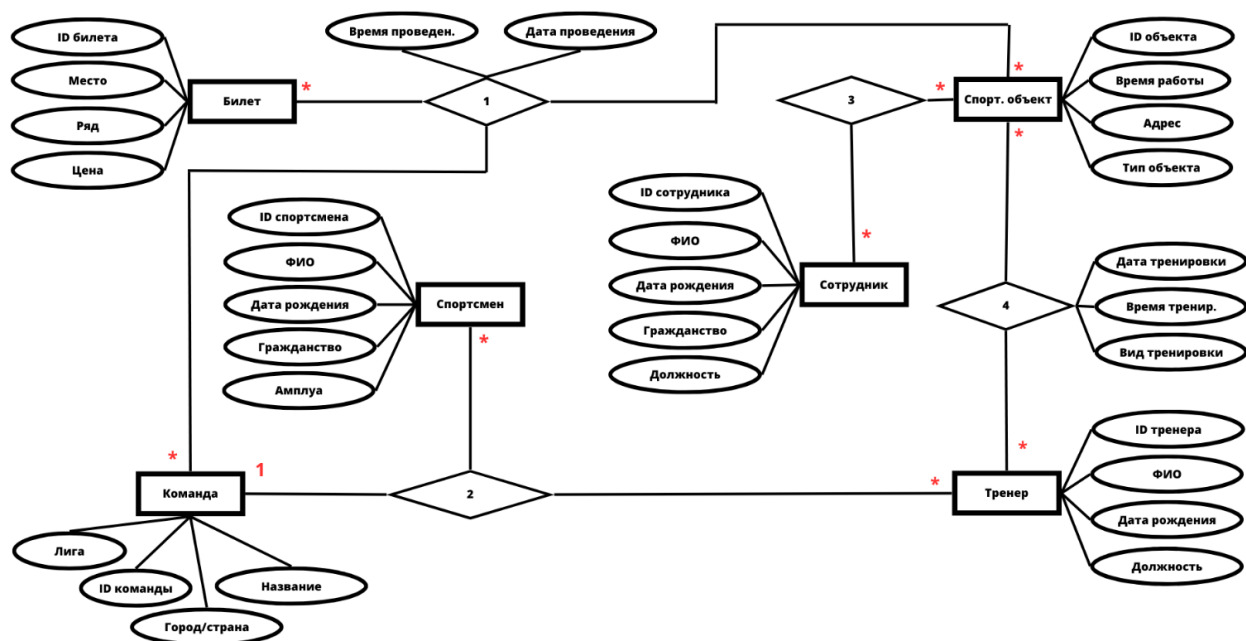
Тема: «Реализация SQL-запросов на простую выборку данных»

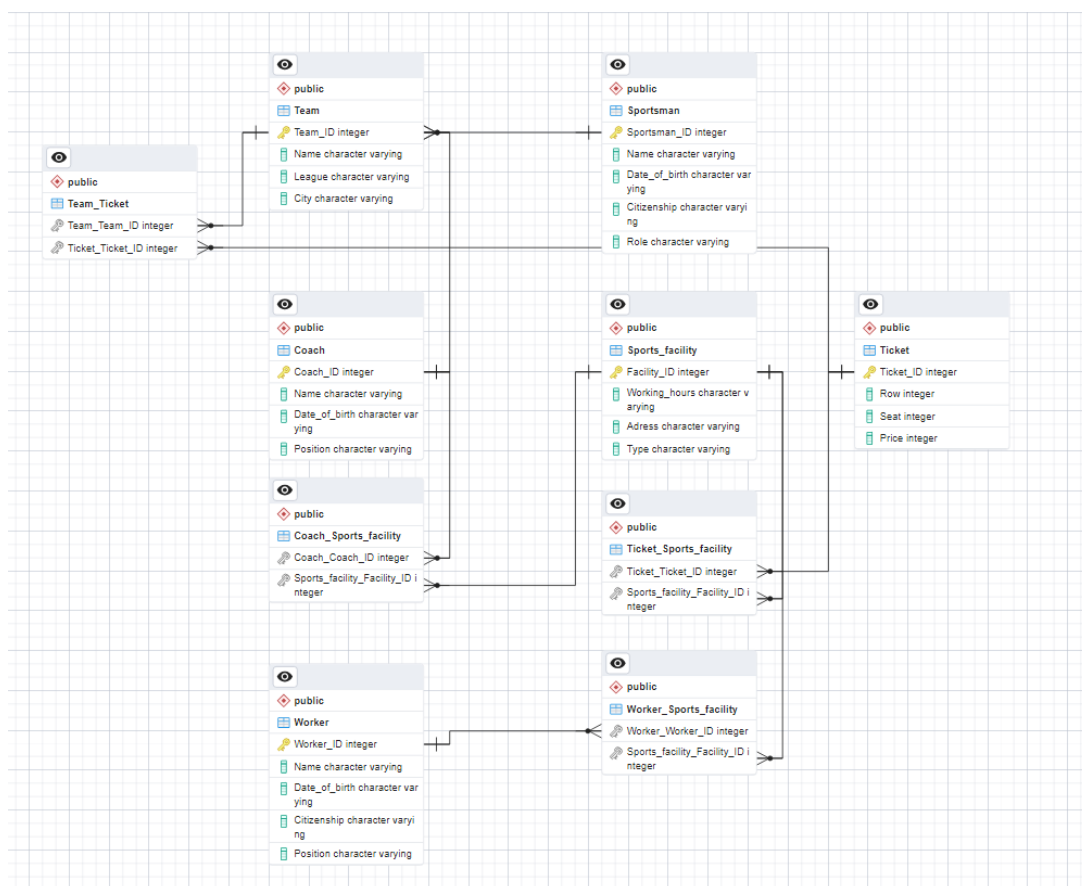Выполнил: Проверила:
ст. гр. 050503   Куприянова Д.В.
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Минск 2023

ER-диаграмма «Хоккейный клуб» и сравнение с реляционной схемой

ER – модель хоккейного клуба

Реляционная схема данных «Хоккейный клуб»

1 – Матч

Билет – Спортивный объект: связь *"многие-ко-многим" с дополнительными атрибутами*.

Билет – Команда: связь "многие-ко-многим" с дополнительными атрибутами.

2 – Принадлежность

Команда – Спортсмен: связь *"один-ко-многим"*.

Команда – Тренер: связь "один-ко-многим".

3 – Место работы

Сотрудник – Спортивный объект: связь *"многие-ко-многим"*.

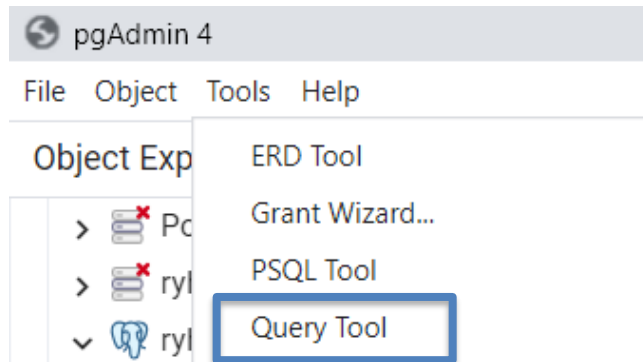**4 – Тренировка**

Тренер – Спортивный объект: связь "многие-ко-многим" с дополнительными атрибутами.

Спортсмен – Спортивный объект: связь "многие-ко-многим" с дополнительными атрибутами.

1. Запросы на выборку данных

Для создания запросов в pgAdmin4 необходимо выбрать инструмент Query Tool:

Для каждой из таблиц сделаем по три запроса.

1.1 Таблица "Sportsman"

Первоначальный вид таблицы получим с помощью запроса:

```
SELECT * FROM "Sportsman"
```

	Sportsman_ID [PK] integer	Name character varying	Date_of_birth character varying	Citizenship character varying	Role character varying
1	0	Pinchuk Vitaly	2002-01-11	Belarus	Forward
2	1	Anas Sam	1993-01-06	USA	Forward
3	2	Kurran Kodie	1989-12-18	Canada	Defender
4	3	Kolosov Alexei	2002-01-04	Belarus	Goalkeeper
5	4	Protas Alexei	2001-01-06	Belarus	Forward
6	5	Stas Andrei	1988-10-18	Belarus	Forward
7	6	Kuznetsov Sergei	2002-05-14	Belarus	Forward
8	7	Merkley Nick	1997-05-23	Canada	Forward
9	8	Liamkin Nikita	1996-02-06	Russia	Defender
10	9	Safonov Ilia	2001-05-30	Russia	Forward
11	10	Tolstushko Vsevolod	1993-05-31	Ukraine	Defender
12	11	Borodai Denis	2002-07-10	Ukraine	Forward
13	12	Kostitsyn Sergei	1987-03-20	Belarus	Forward
14	13	Kudryavtsev Sergei	1995-04-05	Kazakhstan	Goalkeeper
15	14	Lipski Mikita	2003-01-28	Belarus	Forward
16	15	Lipski Ryhor	2003-08-26	Belarus	Defender
17	16	Vikhrov Maxim	2003-01-15	Belarus	Forward
18	17	Marozau Ilia	2003-05-28	Belarus	Forward
19	18	Smirnov Andrey	1994-12-09	Russia	Goalkeeper
20	19	Kripan Gleb	1990-11-11	Belarus	Defender
21	20	Streltsou Edvard	1997-03-05	Belarus	Forward
22	21	Kniga Vladislav	2004-02-07	Russia	Forward
23	22	Pugach Yevgen	1993-05-30	Ukraine	Forward
24	23	Andruskonis Vsevolod	2000-01-06	Latvia	Forward
25	24	Mainich Pavel	2005-02-24	Belarus	Defender
26	25	Bobariko Stanislav	1987-03-08	Russia	Forward
27	26	Kazachenka Dzmitry	1990-06-01	Belarus	Forward
28	27	Maximenka Yegor	2002-10-23	Belarus	Forward
29	28	Fisher Sam	1997-03-04	USA	Defender
30	29	Navitski Zahar	2004-04-18	Belarus	Forward

1. Выбрать из таблицы Sportsman строки, где значение столбца Role = "Goalkeeper"

```
SELECT * FROM "Sportsman" WHERE "Role" = 'Goalkeeper'
```

Результат выполнения запроса:

	Sportsman_ID [PK] integer	Name character varying	Date_of_birth character varying	Citizenship character varying	Role character varying
1	3	Kolosov Alexei	2002-01-04	Belarus	Goalkeeper
2	13	Kudryavtsev Sergei	1995-04-05	Kazakhstan	Goalkeeper
3	18	Smirnov Andrey	1994-12-09	Russia	Goalkeeper

2. Отсортировать таблицу Sportsman, где значение столбца Citizenship = "Belarus" по убыванию Date_of_birth:

```
SELECT * FROM "Sportsman" WHERE "Citizenship" = 'Belarus'
ORDER BY "Date_of_birth" DESC
```

Результат выполнения запроса:

	Sportsman_ID [PK] integer	Name character varying	Date_of_birth character varying	Citizenship character varying	Role character varying
1	24	Mainich Pavel	2005-02-24	Belarus	Defender
2	29	Navitski Zahar	2004-04-18	Belarus	Forward
3	15	Lipski Ryhor	2003-08-26	Belarus	Defender
4	17	Marozau Ilia	2003-05-28	Belarus	Forward
5	14	Lipski Mikita	2003-01-28	Belarus	Forward
6	16	Vikhrov Maxim	2003-01-15	Belarus	Forward
7	27	Maximenka Yegor	2002-10-23	Belarus	Forward
8	6	Kuznetsov Sergei	2002-05-14	Belarus	Forward
9	0	Pinchuk Vitaly	2002-01-11	Belarus	Forward
10	3	Kolosov Alexei	2002-01-04	Belarus	Goalkeeper
11	4	Protas Alexei	2001-01-06	Belarus	Forward
12	20	Streltsou Edvard	1997-03-05	Belarus	Forward
13	19	Kripan Gleb	1990-11-11	Belarus	Defender
14	26	Kazachenka Dzmitry	1990-06-01	Belarus	Forward
15	5	Stas Andrei	1988-10-18	Belarus	Forward
16	12	Kostitsyn Sergei	1987-03-20	Belarus	Forward

3. Вывести столбцы Name и Role тех строк, где в столбцу "Name" встречается сочетание символов "ov':

```
SELECT "Name", "Role" FROM "Sportsman" WHERE "Name" LIKE '%ov%'
```

Результат выполнения запроса:

	Name character varying 🔒	Role character varying 🔒
1	Kolosov Alexei	Goalkeeper
2	Kuznetsov Sergei	Forward
3	Safonov Ilia	Forward
4	Vikhrov Maxim	Forward
5	Smirnov Andrey	Goalkeeper

1.2 Таблица "Coach"

Первоначальный вид таблицы получим с помощью запроса:

```
SELECT * FROM "Coach"
```

	Coach_ID [PK] integer	Name character varying	Date_of_birth character varying	Position character varying
1	0	Kvartalnov Dmitry	1966-03-25	Head coach
2	1	Andrievski Aliaksandr	1993-01-06	Coach
3	2	Zhuravski Dzmitry	1987-07-11	Goaltending coach
4	3	Silinsh Normunds	1983-09-12	Physical coach
5	4	Carbery Spencer	1981-11-09	Head coach
6	5	Allen Scott	1966-04-06	Coach
7	6	Love Mitch	1984-06-15	Coach
8	7	Muller Kirk	1966-02-08	Coach
9	8	Letov Evgenii	1976-02-22	Head coach
10	9	Kravchenko Dmitry	1975-05-12	Head coach
11	10	Bakurin Aliaksandr	1976-05-15	Doctor
12	11	Bilyaletdinov Zinetula	1955-03-15	Head coach
13	12	Pringle Jamie	1982-06-10	Belarus
14	13	Huska Ryan	1975-07-02	Head coach
15	14	MacLean Cail	1976-11-20	Coach
16	15	Tivunov Pavel	1999-01-06	Coach
17	16	Askerka Ivan	1978-11-26	Head coach
18	17	Gorbach Trifon	1956-05-12	Coach
19	18	Reddirs Tom	1987-07-02	Goaltending coach
20	19	Afanasiev Petr	1978-12-18	Head coach
21	20	Zubritski Maksim	1969-02-27	Goaltending coach
22	21	Chorny Andrey	1991-03-07	Physical coach
23	22	Ramanouski Uladzis…	1967-12-02	Head coach
24	23	Rogovoy Evgeniy	1972-03-25	Coach
25	24	Anisenka Aleksandr	1978-04-12	Physical coach
26	25	Ng On Yee	1990-08-17	Coach
27	26	Hurkach Tommie	1987-12-01	Head coach
28	27	Topalov Veselin	1969-11-04	Coach
29	28	Petrov Andres	1987-05-23	Coach
30	29	Sinitsin Vladimir	1994-09-13	Coach

1. Вывести столбцы Name и Position с сортировкой по возрастанию Name:

```
SELECT "Name", "Position" FROM "Coach"
ORDER BY "Name" ASC
```

Результат выполнения запроса:

	Name character varying	Position character varying
1	Afanasiev Petr	Head coach
2	Allen Scott	Coach
3	Andrievski Aliaksandr	Coach
4	Anisenka Aleksandr	Physical coach
5	Askerka Ivan	Head coach
6	Bakurin Aliaksandr	Doctor
7	Bilyaletdinov Zinetula	Head coach
8	Carbery Spencer	Head coach
9	Chorny Andrey	Physical coach
10	Gorbach Trifon	Coach
11	Hurkach Tommie	Head coach
12	Huska Ryan	Head coach
13	Kravchenko Dmitry	Head coach
14	Kvartalnov Dmitry	Head coach
15	Letov Evgenii	Head coach
16	Love Mitch	Coach
17	MacLean Cail	Coach
18	Muller Kirk	Coach
19	Ng On Yee	Coach
20	Petrov Andres	Coach
21	Pringle Jamie	Belarus
22	Ramanouski Uladzis...	Head coach
23	Reddirs Tom	Goaltending coach
24	Rogovoy Evgeniy	Coach
25	Silinsh Normunds	Physical coach
26	Sinitsin Vladimir	Coach
27	Tivunov Pavel	Coach
28	Topalov Veselin	Coach
29	Zhuravski Dzmitry	Goaltending coach
30	Zubritski Maksim	Goaltending coach

2. Вывести столбцы Name, Date_of_birth и Position разрешая дублирование строк, где значение столбца Position = "Head coach"

Создадим дубликат одной из записей:

	Coach_ID [PK] integer	Name character varying	Date_of_birth character varying	Position character varying
1+	30	Kvartalnov Dmitry	1966-03-25	Head coach
2	0	Kvartalnov Dmitry	1966-03-25	Head coach
3	1	Andrievski Aliaksandr	1993-01-06	Coach

```
SELECT ALL "Name", "Date_of_birth", "Position" FROM "Coach"
WHERE "Position" = 'Head coach'
```

Результат выполнения запроса:

	Name character varying	Date_of_birth character varying	Position character varying
1	Kvartalnov Dmitry	1966-03-25	Head coach
2	Carbery Spencer	1981-11-09	Head coach
3	Letov Evgenii	1976-02-22	Head coach
4	Kravchenko Dmitry	1975-05-12	Head coach
5	Bilyaletdinov Zinetula	1955-03-15	Head coach
6	Huska Ryan	1975-07-02	Head coach
7	Askerka Ivan	1978-11-26	Head coach
8	Afanasiev Petr	1978-12-18	Head coach
9	Ramanouski Uladzis...	1967-12-02	Head coach
10	Hurkach Tommie	1987-12-01	Head coach
11	Kvartalnov Dmitry	1966-03-25	Head coach

3. Вывести столбцы Name, Date_of_birth и Position запрещая дублирование строк, где значение столбца Position = "Head coach". Отсортировать по убыванию значения столбца "Date_of_birth"

```
SELECT DISTINCT "Name", "Date_of_birth", "Position" FROM "Coach"
WHERE "Position" = 'Head coach'
ORDER BY "Date_of_birth" DESC
```

Результат выполнения запроса:

	Name character varying 🔒	Date_of_birth character varying 🔒	Position character varying 🔒
1	Hurkach Tommie	1987-12-01	Head coach
2	Carbery Spencer	1981-11-09	Head coach
3	Afanasiev Petr	1978-12-18	Head coach
4	Askerka Ivan	1978-11-26	Head coach
5	Letov Evgenii	1976-02-22	Head coach
6	Huska Ryan	1975-07-02	Head coach
7	Kravchenko Dmitry	1975-05-12	Head coach
8	Ramanouski Uladzis...	1967-12-02	Head coach
9	Kvartalnov Dmitry	1966-03-25	Head coach
10	Bilyaletdinov Zinetula	1955-03-15	Head coach

1.3 Таблица "Worker"

Первоначальный вид таблицы получим с помощью запроса:

```
SELECT * FROM "Worker"
```

	Worker_ID [PK] integer	Name character varying	Date_of_birth character varying	Citizenship character varying	Position character varying
1	0	Bedzyk Stanislav	2002-07-09	Belarus	Programmer
2	1	Kazachenka Dzmitry	1999-01-06	Belarus	Manager
3	2	Niamtsov Vitaly	1989-09-23	Belarus	Camerman
4	3	Maglich Hanna	1966-01-03	Belarus	Cleaner
5	4	Frolovich Andrei	1988-01-06	Belarus	Watchman
6	5	Gurski Maksim	1988-10-18	Belarus	Security guard
7	6	Prozorov Vadim	1992-01-14	Belarus	Watchman
8	7	Kreidich Vasil	1997-09-03	Russia	Security guard
9	8	Androsau Ilia	1976-12-22	Belarus	Camerman
10	9	Klimovich Ludmila	1962-03-30	Belarus	Cleaner
11	10	Dudnik Viktor	1955-03-22	Kyrgyztan	Plumber
12	11	Baranovski Andrei	2002-07-10	Belarus	Programmer
13	12	Ekimenko Valeriya	1987-03-20	Belarus	Watchman
14	13	Skripnik Vladlen	1975-11-15	Belarus	Manager
15	14	Safronov Ryhor	1993-07-21	Belarus	Manager

16	15	Overchenko Vitaliy	1976-02-17	Russia	Handyman
17	16	Zayats Vital	1988-07-19	Belarus	Manager
18	17	Paroshchanka Ryhor	1999-05-28	Belarus	Manager
19	18	Ruf Aleksei	1978-12-05	Belarus	Handyman
20	19	Borikov Egor	1990-03-25	Russia	Manager
21	20	Letau Pavel	1986-11-04	Belarus	Handyman
22	21	Marhun Mikalai	1998-08-12	Belarus	Camerman
23	22	Apanasevich Yegor	1968-11-19	Belarus	Handyman
24	23	Smirnou Pavel	1972-03-20	Belarus	Handyman
25	24	Zaharchanka Adam	1962-11-04	Belarus	Cleaner
26	25	Strok Dzmitry	1964-12-09	Belarus	Cleaner
27	26	Aleinik Vsevolod	1987-01-19	Belarus	Manager
28	27	Mihalchanka Makism	1987-06-30	Belarus	Handyman
29	28	Bely Raman	1992-08-23	Belarus	Camerman
30	29	Dudnik Vasil	1991-03-12	Belarus	Handyman

1. Произвести внутреннее соединение таблиц "Worker" и "Coach". Вывести таблицу со строками у которых в двух таблицах совпадает столбец Name. Вывести таблицу Coach целиком, а из таблицы "Worker" взять столбец Citizenship.

Добавим в таблицу Worker идентичную строке таблицы "Coach" запись:

	Worker_ID [PK] integer	Name character varying	Date_of_birth character varying	Citizenship character varying	Position character varying
1+	31	Kvartalnov Dmitry	1966-03-25	Russia	Head Coach
2	0	Bedzyk Stanislav	2002-07-09	Belarus	Programmer
3	1	Kazachenka Dzmitry	1999-01-06	Belarus	Manager
4	2	Niamtsov Vitaly	1989-09-23	Belarus	Camerman

```
SELECT "Coach".*, "Worker"."Citizenship"
FROM "Worker"
INNER JOIN "Coach" ON "Worker"."Name" = "Coach"."Name";
```

Результат выполнения запроса:

	Coach_ID integer	Name character varying	Date_of_birth character varying	Position character varying	Citizenship character varying
1	0	Kvartalnov Dmitry	1966-03-25	Head coach	Russia
2	30	Kvartalnov Dmitry	1966-03-25	Head coach	Russia

2. Вывести все уникальные Position в порядке возрастания

```
SELECT DISTINCT "Position" from "Worker"
ORDER BY "Position" ASC
```

Результат выполнения запроса:

	Position character varying 🔒
1	Camerman
2	Cleaner
3	Handyman
4	Head Coach
5	Manager
6	Plumber
7	Programmer
8	Security guard
9	Watchman

3. Вывести все столбцы записей, у которых Date_of_birth в ноябре. Отсортировать по убыванию значения столбца Name.

```
SELECT * FROM "Worker" WHERE "Date_of_birth" LIKE '%-11-%'
ORDER BY "Name" DESC
```

Результат выполнения запроса:

	Worker_ID [PK] integer	Name character varying	Date_of_birth character varying	Citizenship character varying	Position character varying
1	24	Zaharchanka Adam	1962-11-04	Belarus	Cleaner
2	13	Skripnik Vladlen	1975-11-15	Belarus	Manager
3	20	Letau Pavel	1986-11-04	Belarus	Handyman
4	22	Apanasevich Yegor	1968-11-19	Belarus	Handyman

4. Произвести левое внешнее соединение таблиц "Worker" и "Coach" по столбцу Name.

```
SELECT * FROM "Worker"
LEFT OUTER JOIN "Coach" ON "Worker"."Name" = "Coach"."Name";
```

Результат выполнения запроса:

	Worker_ID integer	Name character varying	Date_of_birth character vary	Citizenship character var	Position character varying	Coach_ID integer	Name character varying	Date_of_birth character varyi	Position character varying
1	31	Kvartalnov Dmitry	1966-03-25	Russia	Head Coach	0	Kvartalnov Dmitry	1966-03-25	Head coach
2	31	Kvartalnov Dmitry	1966-03-25	Russia	Head Coach	30	Kvartalnov Dmitry	1966-03-25	Head coach
3	23	Smirnou Pavel	1972-03-20	Belarus	Handyman	[null]	[null]	[null]	[null]
4	3	Maglich Hanna	1966-01-03	Belarus	Cleaner	[null]	[null]	[null]	[null]
5	28	Bely Raman	1992-08-23	Belarus	Camerman	[null]	[null]	[null]	[null]
6	22	Apanasevich Yegor	1968-11-19	Belarus	Handyman	[null]	[null]	[null]	[null]
7	14	Safronov Ryhor	1993-07-21	Belarus	Manager	[null]	[null]	[null]	[null]
8	7	Kreidich Vasil	1997-09-03	Russia	Security guard	[null]	[null]	[null]	[null]
9	0	Bedzyk Stanislav	2002-07-09	Belarus	Programmer	[null]	[null]	[null]	[null]
10	5	Gurski Maksim	1988-10-18	Belarus	Security guard	[null]	[null]	[null]	[null]
11	6	Prozorov Vadim	1992-01-14	Belarus	Watchman	[null]	[null]	[null]	[null]
12	9	Klimovich Ludmila	1962-03-30	Belarus	Cleaner	[null]	[null]	[null]	[null]
13	4	Frolovich Andrei	1988-01-06	Belarus	Watchman	[null]	[null]	[null]	[null]
14	15	Overchenko Vitaliy	1976-02-17	Russia	Handyman	[null]	[null]	[null]	[null]
15	26	Aleinik Vsevolod	1987-01-19	Belarus	Manager	[null]	[null]	[null]	[null]
16	29	Dudnik Vasil	1991-03-12	Belarus	Handyman	[null]	[null]	[null]	[null]
17	27	Mihalchanka Makism	1987-06-30	Belarus	Handyman	[null]	[null]	[null]	[null]
18	25	Strok Dzmitry	1964-12-09	Belarus	Cleaner	[null]	[null]	[null]	[null]
19	19	Borikov Egor	1990-03-25	Russia	Manager	[null]	[null]	[null]	[null]
20	18	Ruf Aleksei	1978-12-05	Belarus	Handyman	[null]	[null]	[null]	[null]
21	1	Kazachenka Dzmitry	1999-01-06	Belarus	Manager	[null]	[null]	[null]	[null]
22	8	Androsau Ilia	1976-12-22	Belarus	Camerman	[null]	[null]	[null]	[null]
23	2	Niamtsov Vitaly	1989-09-23	Belarus	Camerman	[null]	[null]	[null]	[null]
24	10	Dudnik Viktor	1955-03-22	Kyrgyztan	Plumber	[null]	[null]	[null]	[null]
25	16	Zayats Vital	1988-07-19	Belarus	Manager	[null]	[null]	[null]	[null]
26	24	Zaharchanka Adam	1962-11-04	Belarus	Cleaner	[null]	[null]	[null]	[null]
27	20	Letau Pavel	1986-11-04	Belarus	Handyman	[null]	[null]	[null]	[null]
28	11	Baranovski Andrei	2002-07-10	Belarus	Programmer	[null]	[null]	[null]	[null]
29	13	Skripnik Vladlen	1975-11-15	Belarus	Manager	[null]	[null]	[null]	[null]
30	21	Marhun Mikalai	1998-08-12	Belarus	Camerman	[null]	[null]	[null]	[null]
31	12	Ekimenko Valeriya	1987-03-20	Belarus	Watchman	[null]	[null]	[null]	[null]
32	17	Paroshchanka Ryhor	1999-05-28	Belarus	Manager	[null]	[null]	[null]	[null]

5. Произвести правое внешнее соединение таблиц "Worker" и "Coach" по столбцу Name.

```
SELECT * FROM "Worker"
RIGHT OUTER JOIN "Coach" ON "Worker"."Name" = "Coach"."Name";
```

Результат выполнения запроса:

	Worker_ID integer	Name character varying	Date_of_birth character varying	Citizenship character varying	Position character varying	Coach_ID integer	Name character varying	Date_of_birth character varyi	Position character varying
1	31	Kvartalnov Dmitry	1966-03-25	Russia	Head Coach	0	Kvartalnov Dmitry	1966-03-25	Head coach
2	[null]	[null]	[null]	[null]	[null]	1	Andrievski Aliaksandr	1993-01-06	Coach
3	[null]	[null]	[null]	[null]	[null]	2	Zhuravski Dzmitry	1987-07-11	Goaltending co...
4	[null]	[null]	[null]	[null]	[null]	3	Silinsh Normunds	1983-09-12	Physical coach
5	[null]	[null]	[null]	[null]	[null]	4	Carbery Spencer	1981-11-09	Head coach
6	[null]	[null]	[null]	[null]	[null]	5	Allen Scott	1966-04-06	Coach
7	[null]	[null]	[null]	[null]	[null]	6	Love Mitch	1984-06-15	Coach
8	[null]	[null]	[null]	[null]	[null]	7	Muller Kirk	1966-02-08	Coach
9	[null]	[null]	[null]	[null]	[null]	8	Letov Evgenii	1976-02-22	Head coach
10	[null]	[null]	[null]	[null]	[null]	9	Kravchenko Dmitry	1975-05-12	Head coach
11	[null]	[null]	[null]	[null]	[null]	10	Bakurin Aliaksandr	1976-05-15	Doctor
12	[null]	[null]	[null]	[null]	[null]	11	Bilyaletdinov Zinetula	1955-03-15	Head coach
13	[null]	[null]	[null]	[null]	[null]	12	Pringle Jamie	1982-06-10	Belarus
14	[null]	[null]	[null]	[null]	[null]	13	Huska Ryan	1975-07-02	Head coach
15	[null]	[null]	[null]	[null]	[null]	14	MacLean Cail	1976-11-20	Coach
16	[null]	[null]	[null]	[null]	[null]	15	Tivunov Pavel	1999-01-06	Coach
17	[null]	[null]	[null]	[null]	[null]	16	Askerka Ivan	1978-11-26	Head coach
18	[null]	[null]	[null]	[null]	[null]	17	Gorbach Trifon	1956-05-12	Coach

19	[null]	[null]	[null]	[null]	[null]	18	Reddirs Tom	1987-07-02	Goaltending co...
20	[null]	[null]	[null]	[null]	[null]	19	Afanasiev Petr	1978-12-18	Head coach
21	[null]	[null]	[null]	[null]	[null]	20	Zubritski Maksim	1969-02-27	Goaltending co...
22	[null]	[null]	[null]	[null]	[null]	21	Chorny Andrey	1991-03-07	Physical coach
23	[null]	[null]	[null]	[null]	[null]	22	Ramanouski Uladzisl...	1967-12-02	Head coach
24	[null]	[null]	[null]	[null]	[null]	23	Rogovoy Evgeniy	1972-03-25	Coach
25	[null]	[null]	[null]	[null]	[null]	24	Anisenka Aleksandr	1978-04-12	Physical coach
26	[null]	[null]	[null]	[null]	[null]	25	Ng On Yee	1990-08-17	Coach
27	[null]	[null]	[null]	[null]	[null]	26	Hurkach Tommie	1987-12-01	Head coach
28	[null]	[null]	[null]	[null]	[null]	27	Topalov Veselin	1969-11-04	Coach
29	[null]	[null]	[null]	[null]	[null]	28	Petrov Andres	1987-05-23	Coach
30	[null]	[null]	[null]	[null]	[null]	29	Sinitsin Vladimir	1994-09-13	Coach
31	31	Kvartalnov Dmitry	1966-03-25	Russia	Head Coach	30	Kvartalnov Dmitry	1966-03-25	Head coach

6. Произвести полное внешнее соединение таблиц "Worker" и "Coach" по столбцу Name.

```
SELECT * FROM "Worker"
FULL OUTER JOIN "Coach" ON "Worker"."Name" = "Coach"."Name";
```

Результат выполнения запроса:

	Worker_ID integer	Name character varying	Date_of_birth character varyi	Citizenship character varyin	Position character varyi	Coach_ID integer	Name character varying	Date_of_birth character varyi	Position character varying
1	31	Kvartalnov Dmitry	1966-03-25	Russia	Head Coach	0	Kvartalnov Dmitry	1966-03-25	Head coach
2	[null]	[null]	[null]	[null]	[null]	1	Andrievski Aliaksandr	1993-01-06	Coach
3	[null]	[null]	[null]	[null]	[null]	2	Zhuravski Dzmitry	1987-07-11	Goaltending coach
4	[null]	[null]	[null]	[null]	[null]	3	Silinsh Normunds	1983-09-12	Physical coach
5	[null]	[null]	[null]	[null]	[null]	4	Carbery Spencer	1981-11-09	Head coach
6	[null]	[null]	[null]	[null]	[null]	5	Allen Scott	1966-04-06	Coach
7	[null]	[null]	[null]	[null]	[null]	6	Love Mitch	1984-06-15	Coach
8	[null]	[null]	[null]	[null]	[null]	7	Muller Kirk	1966-02-08	Coach
9	[null]	[null]	[null]	[null]	[null]	8	Letov Evgenii	1976-02-22	Head coach
10	[null]	[null]	[null]	[null]	[null]	9	Kravchenko Dmitry	1975-05-12	Head coach
11	[null]	[null]	[null]	[null]	[null]	10	Bakurin Aliaksandr	1976-05-15	Doctor
12	[null]	[null]	[null]	[null]	[null]	11	Bilyaletdinov Zinetula	1955-03-15	Head coach
13	[null]	[null]	[null]	[null]	[null]	12	Pringle Jamie	1982-06-10	Belarus
14	[null]	[null]	[null]	[null]	[null]	13	Huska Ryan	1975-07-02	Head coach
15	[null]	[null]	[null]	[null]	[null]	14	MacLean Cail	1976-11-20	Coach
16	[null]	[null]	[null]	[null]	[null]	15	Tivunov Pavel	1999-01-06	Coach
17	[null]	[null]	[null]	[null]	[null]	16	Askerka Ivan	1978-11-26	Head coach
18	[null]	[null]	[null]	[null]	[null]	17	Gorbach Trifon	1956-05-12	Coach
19	[null]	[null]	[null]	[null]	[null]	18	Reddirs Tom	1987-07-02	Goaltending coach
20	[null]	[null]	[null]	[null]	[null]	19	Afanasiev Petr	1978-12-18	Head coach
21	[null]	[null]	[null]	[null]	[null]	20	Zubritski Maksim	1969-02-27	Goaltending coach
22	[null]	[null]	[null]	[null]	[null]	21	Chorny Andrey	1991-03-07	Physical coach
23	[null]	[null]	[null]	[null]	[null]	22	Ramanouski Uladzis...	1967-12-02	Head coach
24	[null]	[null]	[null]	[null]	[null]	23	Rogovoy Evgeniy	1972-03-25	Coach
25	[null]	[null]	[null]	[null]	[null]	24	Anisenka Aleksandr	1978-04-12	Physical coach
26	[null]	[null]	[null]	[null]	[null]	25	Ng On Yee	1990-08-17	Coach
27	[null]	[null]	[null]	[null]	[null]	26	Hurkach Tommie	1987-12-01	Head coach
28	[null]	[null]	[null]	[null]	[null]	27	Topalov Veselin	1969-11-04	Coach
29	[null]	[null]	[null]	[null]	[null]	28	Petrov Andres	1987-05-23	Coach
30	[null]	[null]	[null]	[null]	[null]	29	Sinitsin Vladimir	1994-09-13	Coach
31	31	Kvartalnov Dmitry	1966-03-25	Russia	Head Coach	30	Kvartalnov Dmitry	1966-03-25	Head coach
32	23	Smirnou Pavel	1972-03-20	Belarus	Handyman	[null]	[null]	[null]	[null]
33	3	Maglich Hanna	1966-01-03	Belarus	Cleaner	[null]	[null]	[null]	[null]
34	28	Bely Raman	1992-08-23	Belarus	Camerman	[null]	[null]	[null]	[null]
35	22	Apanasevich Yegor	1968-11-19	Belarus	Handyman	[null]	[null]	[null]	[null]
36	14	Safronov Ryhor	1993-07-21	Belarus	Manager	[null]	[null]	[null]	[null]
37	7	Kreidich Vasil	1997-09-03	Russia	Security gu...	[null]	[null]	[null]	[null]
38	0	Bedzyk Stanislav	2002-07-09	Belarus	Programmer	[null]	[null]	[null]	[null]
39	5	Gurski Maksim	1988-10-18	Belarus	Security gu...	[null]	[null]	[null]	[null]
40	6	Prozorov Vadim	1992-01-14	Belarus	Watchman	[null]	[null]	[null]	[null]
41	9	Klimovich Ludmila	1962-03-30	Belarus	Cleaner	[null]	[null]	[null]	[null]
42	4	Frolovich Andrei	1988-01-06	Belarus	Watchman	[null]	[null]	[null]	[null]

43	15	Overchenko Vitaliy	1976-02-17	Russia	Handyman	[null]	[null]	[null]	[null]
44	26	Aleinik Vsevolod	1987-01-19	Belarus	Manager	[null]	[null]	[null]	[null]
45	29	Dudnik Vasil	1991-03-12	Belarus	Handyman	[null]	[null]	[null]	[null]
46	27	Mihalchanka Makism	1987-06-30	Belarus	Handyman	[null]	[null]	[null]	[null]
47	25	Strok Dzmitry	1964-12-09	Belarus	Cleaner	[null]	[null]	[null]	[null]
48	19	Borikov Egor	1990-03-25	Russia	Manager	[null]	[null]	[null]	[null]
49	18	Ruf Aleksei	1978-12-05	Belarus	Handyman	[null]	[null]	[null]	[null]
50	1	Kazachenka Dzmitry	1999-01-06	Belarus	Manager	[null]	[null]	[null]	[null]
51	8	Androsau Ilia	1976-12-22	Belarus	Camerman	[null]	[null]	[null]	[null]
52	2	Niamtsov Vitaly	1989-09-23	Belarus	Camerman	[null]	[null]	[null]	[null]
53	10	Dudnik Viktor	1955-03-22	Kyrgyztan	Plumber	[null]	[null]	[null]	[null]
54	16	Zayats Vital	1988-07-19	Belarus	Manager	[null]	[null]	[null]	[null]
55	24	Zaharchanka Adam	1962-11-04	Belarus	Cleaner	[null]	[null]	[null]	[null]
56	20	Letau Pavel	1986-11-04	Belarus	Handyman	[null]	[null]	[null]	[null]
57	11	Baranovski Andrei	2002-07-10	Belarus	Programmer	[null]	[null]	[null]	[null]
58	13	Skripnik Vladlen	1975-11-15	Belarus	Manager	[null]	[null]	[null]	[null]
59	21	Marhun Mikalai	1998-08-12	Belarus	Camerman	[null]	[null]	[null]	[null]
60	12	Ekimenko Valeriya	1987-03-20	Belarus	Watchman	[null]	[null]	[null]	[null]
61	17	Paroshchanka Ryhor	1999-05-28	Belarus	Manager	[null]	[null]	[null]	[null]

1.4 Таблица "Sports facility"

Первоначальный вид таблицы получим с помощью запроса:

```
SELECT * FROM "Sports_facility"
```

	Facility_ID [PK] integer	Working_hours character varying	Adress character varying	Type character varying
1	0	8-22	Minsk, Kolasa 38	Hockey Palace
2	1	8-22	Minsk, Kolasa 24	Hockey Palace
3	2	9-23	Minsk, Surganova 15/2	Swimming pool
4	3	8-24	Minsk, Rokossovskogo 44	Tennis Center
5	4	6-24	Minsk, P.Brovki 10	Stadium
6	5	8-24	Minsk, Alibegova 44	Sports Center
7	6	6-24	Minsk, Dziarzhynskaga 128	Stadium
8	7	6-24	Minsk, Nezalezhnastsi 12	Hockey Palace
9	8	6-24	Zhlobin, K.Marksa 5	Hockey Palace
10	9	8-23	Grodno, Kazachenka 32	Hockey Palace
11	10	0-24	Minsk, Nezalezhnastsi 44	Stadium
12	11	6-24	Kazan, Suvorova 32/3	Hockey Palace
13	12	0-0	Kyiv, Centralna 50	Hockey Palace
14	13	7-24	Kyiv, Mista Shalett 6	Hockey Palace
15	14	6-24	Gomel, Mazurava 110	Hockey Palace
16	15	6-23	Rechitsa, Marksa 44	Stadium
17	16	9-23	Minsk, Dziarzhynskaga 24	Stadium
18	17	8-22	Minsk, Kolasa 21/2	Swimming pool
19	18	6-24	Minsk, Alibegova 12	Hockey Palace
20	19	6-24	Minsk, Nezalezhnastsi 120	Hockey Palace
21	20	8-22	Minsk, Nezalezhnastsi 100	Stadium

22	21	6-24	Grodno, Shipko 34	Hockey Palace
23	22	8-22	Minsk, Surganova 12	Swimming pool
24	23	9-23	Kyiv, Shevchenka 23	Hockey Palace
25	24	6-24	Minsk, Surganova 32	Hockey Palace
26	25	0-24	Minsk, Rokossovskogo 123	Stadium
27	26	8-22	Minsk, Kolasa 101	Hockey Palace
28	27	9-23	Minsk, Nezalezhnastsi 57	Hockey Palace
29	28	0-24	Minsk, Dziarzhynskaga 67	Stadium
30	29	0-24	Minsk, Brovki 6	Stadium

1. Вывести спортивные объекты, которые расположены в г.Киеве

```
SELECT * FROM "Sports_facility"
WHERE "Adress" LIKE '%Kyiv%'
```

Результат выполнения запроса:

	Facility_ID [PK] integer	Working_hours character varying	Adress character varying	Type character varying
1	12	0-0	Kyiv, Centralna 50	Hockey Palace
2	13	7-24	Kyiv, Mista Shalett 6	Hockey Palace
3	23	9-23	Kyiv, Shevchenka 23	Hockey Palace

2. Вывести столбцы Facility_ID, Adress, Type спортивных объектов с нечётным ID. Отсортировать по убыванию Adress

```
SELECT "Facility_ID", "Adress", "Type" FROM "Sports_facility"
WHERE "Facility_ID" % 2 = 1
ORDER BY "Adress" DESC
```

Результат выполнения запроса:

	Facility_ID [PK] integer	Adress character varying	Type character varying
1	15	Rechitsa, Marksa 44	Stadium
2	3	Minsk, Rokossovskogo 44	Tennis Center
3	25	Minsk, Rokossovskogo 123	Stadium
4	27	Minsk, Nezalezhnastsi 57	Hockey Palace
5	19	Minsk, Nezalezhnastsi 120	Hockey Palace
6	7	Minsk, Nezalezhnastsi 12	Hockey Palace
7	1	Minsk, Kolasa 24	Hockey Palace
8	17	Minsk, Kolasa 21/2	Swimming pool

	9	29	Minsk, Brovki 6	Stadium
10	5	Minsk, Alibegova 44	Sports Center
11	23	Kyiv, Shevchenka 23	Hockey Palace
12	13	Kyiv, Mista Shalett 6	Hockey Palace
13	11	Kazan, Suvorova 32/3	Hockey Palace
14	21	Grodno, Shipko 34	Hockey Palace
15	9	Grodno, Kazachenka 32	Hockey Palace

3. Вывести столбцы Facility_ID, Adress первых 15 записей в которых значение столбца Type = "Hockey Palace"

```
SELECT "Facility_ID", "Adress", "Type" FROM "Sports_facility"
WHERE "Type" = 'Hockey Palace' LIMIT 15
```

Результат выполнения запроса:

	Facility_ID [PK] integer	Adress character varying	Type character varying
1	0	Minsk, Kolasa 38	Hockey Palace
2	1	Minsk, Kolasa 24	Hockey Palace
3	7	Minsk, Nezalezhnastsi 12	Hockey Palace
4	8	Zhlobin, K.Marksa 5	Hockey Palace
5	9	Grodno, Kazachenka 32	Hockey Palace
6	11	Kazan, Suvorova 32/3	Hockey Palace
7	12	Kyiv, Centralna 50	Hockey Palace
8	13	Kyiv, Mista Shalett 6	Hockey Palace
9	14	Gomel, Mazurava 110	Hockey Palace
10	18	Minsk, Alibegova 12	Hockey Palace
11	19	Minsk, Nezalezhnastsi 120	Hockey Palace
12	21	Grodno, Shipko 34	Hockey Palace
13	23	Kyiv, Shevchenka 23	Hockey Palace
14	24	Minsk, Surganova 32	Hockey Palace
15	26	Minsk, Kolasa 101	Hockey Palace

1.5 Таблица "Ticket"

Первоначальный вид таблицы получим с помощью запроса:

```
SELECT * FROM "Ticket"
```

	Ticket_ID [PK] integer	Row integer	Seat integer	Price integer
1	0	8	1	7
2	1	1	1	5
3	2	1	2	5
4	3	1	3	5
5	4	1	4	5
6	5	1	5	5
7	6	1	6	5
8	7	3	1	6
9	8	3	2	6
10	9	3	3	6
11	10	3	4	6
12	11	3	5	6
13	12	3	6	6
14	13	3	7	6
15	14	3	8	6
16	15	4	1	4
17	16	4	2	4
18	17	4	3	4
19	18	4	4	4
20	19	4	5	4
21	20	4	6	4
22	21	4	7	4
23	22	4	8	4
24	23	5	1	5
25	24	5	2	5
26	25	5	3	5
27	26	5	4	5
28	27	5	5	5
29	28	5	6	5
30	29	5	7	5

1. Вывести 5 самых дорогих билетов

```sql
SELECT * FROM "Ticket"
ORDER BY "Price" DESC
LIMIT 5
```

Результат выполнения запроса:

	Ticket_ID [PK] integer	Row integer	Seat integer	Price integer
1	0	8	1	7
2	9	3	3	6
3	8	3	2	6
4	7	3	1	6
5	10	3	4	6

2. Вывести столбцы Row, Seat, Price билетов на 3 и 4 ряды

```sql
SELECT "Row", "Seat", "Price" FROM "Ticket"
WHERE "Row" = 3 OR "Row" = 4
```

Результат выполнения запроса:

	Row integer	Seat integer	Price integer
1	3	1	6
2	3	2	6
3	3	3	6
4	3	4	6
5	3	5	6
6	3	6	6
7	3	7	6
8	3	8	6
9	4	1	4
10	4	2	4
11	4	3	4
12	4	4	4
13	4	5	4
14	4	6	4
15	4	7	4
16	4	8	4

3. Вывести билеты стоимостью до 5.

```
SELECT * FROM "Ticket"
WHERE "Price" <= 5
```

Результат выполнения запроса:

	Ticket_ID [PK] integer	Row integer	Seat integer	Price integer
1	1	1	1	5
2	2	1	2	5
3	3	1	3	5
4	4	1	4	5
5	5	1	5	5
6	6	1	6	5
7	15	4	1	4
8	16	4	2	4
9	17	4	3	4
10	18	4	4	4
11	19	4	5	4
12	20	4	6	4
13	21	4	7	4
14	22	4	8	4
15	23	5	1	5
16	24	5	2	5
17	25	5	3	5
18	26	5	4	5
19	27	5	5	5
20	28	5	6	5
21	29	5	7	5

1.6 Таблица "Team"

Первоначальный вид таблицы получим с помощью запроса:

`SELECT * FROM "Team"`

	Team_ID [PK] integer	Name character varying	League character varying	City character varying
1	0	Dinamo-Mn	KHL	Minsk
2	1	Metallurg-Mg	KHL	Magnitogorsk
3	2	Ak-Bars	KHL	Kazan
4	3	Avangard	KHL	Omsk
5	4	Barys	KHL	Astana
6	5	Admiral	KHL	Vladivostok
7	6	Lokomotiv	KHL	Yaroslavl
8	7	Sokol	UHL	Kyiv
9	8	Dnepr	UHL	Kherson
10	9	Metallurg-Zhl	Extraliga-BLR	Zhlobin
11	10	Neman	Extraliga-BLR	Grodno
12	11	Dinamo-Mol	Extraliga-BLR	Molodechno
13	12	Vitebsk	Extraliga-BLR	Vitebsk
14	13	Flames	NHL	Calgary
15	14	Capitals	NHL	Washington
16	15	Lida	Extraliga-BLR	Lida
17	16	Mogilev	Extraliga-BLR	Mogilev
18	17	Lokomotiv-Orsha	Extraliga-BLR	Orsha
19	18	Gomel	Extraliga-BLR	Gomel
20	19	Brest	Extraliga-BLR	Brest
21	20	Yunost	Extraliga-BLR	Minsk
22	21	Sochi	KHL	Sochi
23	22	Lada	KHL	Tolyatti
24	23	SKA	KHL	St-Peterburg
25	24	Spartak	KHL	Moskow
26	25	Severstal	KHL	Cherepovets
27	26	Rangers	NHL	NYC
28	27	Predators	NHL	Nashville
29	28	Golden Knights	NHL	Vegas
30	29	Panters	NHL	Florida

1. Вывести команды, у которых в названии присутствует "Dinamo"

```sql
SELECT * FROM "Team"
WHERE "Name" LIKE '%Dinamo%'
```

Результат выполнения запроса:

	Team_ID [PK] integer	Name character varying	League character varying	City character varying
1	0	Dinamo-Mn	KHL	Minsk
2	11	Dinamo-Mol	Extraliga-BLR	Molodechno

2. Вывести команды лиги KHL. Отсортировать по возрастанию названия.

```sql
SELECT * FROM "Team"
WHERE "League" = 'KHL'
ORDER BY "Name" ASC
```

Результат выполнения запроса:

	Team_ID [PK] integer	Name character varying	League character varying	City character varying
1	5	Admiral	KHL	Vladivostok
2	2	Ak-Bars	KHL	Kazan
3	3	Avangard	KHL	Omsk
4	4	Barys	KHL	Astana
5	0	Dinamo-Mn	KHL	Minsk
6	22	Lada	KHL	Tolyatti
7	6	Lokomotiv	KHL	Yaroslavl
8	1	Metallurg-Mg	KHL	Magnitogorsk
9	25	Severstal	KHL	Cherepovets
10	23	SKA	KHL	St-Peterburg
11	21	Sochi	KHL	Sochi
12	24	Spartak	KHL	Moskow

3. Вывести столбцы Name, League команд лиги "Extraliga-BLR", у которых в названии есть буква 'o'

```sql
SELECT * FROM "Team"
WHERE "League" = 'Extraliga-BLR' AND "Name" LIKE '%o%'
```

Результат выполнения запроса:

	Team_ID [PK] integer	Name character varying	League character varying	City character varying
1	11	Dinamo-Mol	Extraliga-BLR	Molodechno
2	16	Mogilev	Extraliga-BLR	Mogilev
3	17	Lokomotiv-Orsha	Extraliga-BLR	Orsha
4	18	Gomel	Extraliga-BLR	Gomel
5	20	Yunost	Extraliga-BLR	Minsk

ВЫВОД

В ходе выполнения лабораторной работы были изучены и использованы на практике различные операторы для взаимодействия с базой данных такие как SELECT, FROM, WHERE, LIKE, OR, AND, ORDER BY, ASC, DESC, LIMIT, DISTINCT, ALL, INNER JOIN, OUTER JOIN.