

Белорусский Государственный Университет
Информатики и Радиоэлектроники
Кафедра ЭВМ

Отчет по лабораторной работе № 3

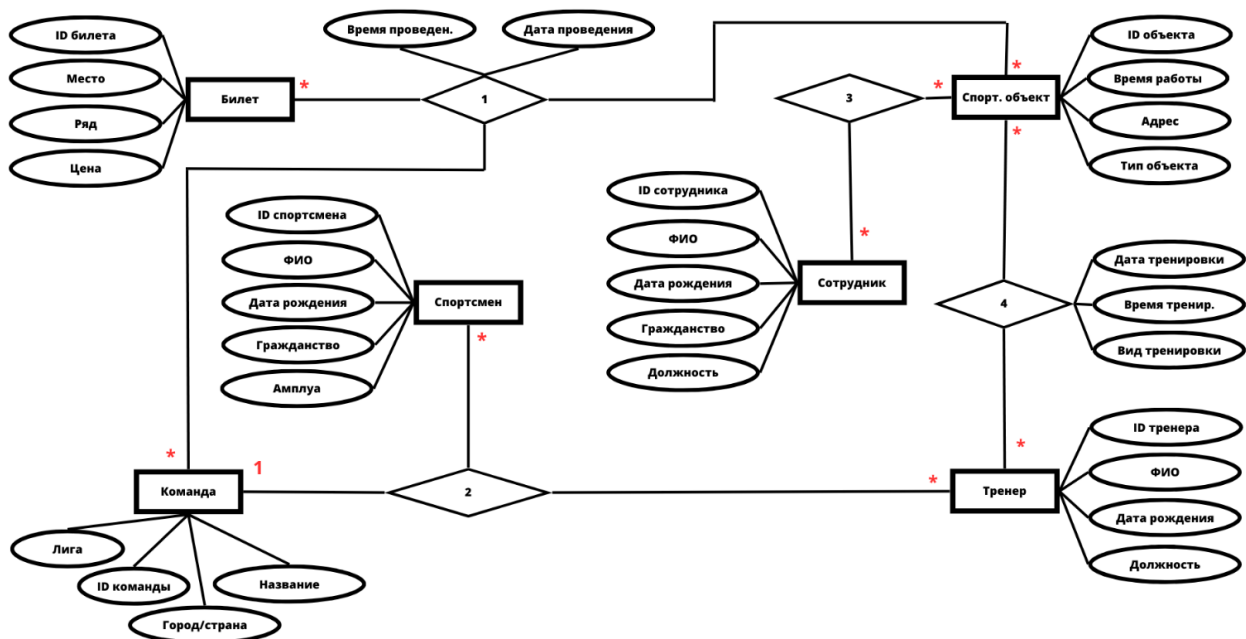
Тема: «Реализация SQL-запросов для создания схемы базы данных»

Выполнил:
ст. гр. 050503
Липский Г.В.

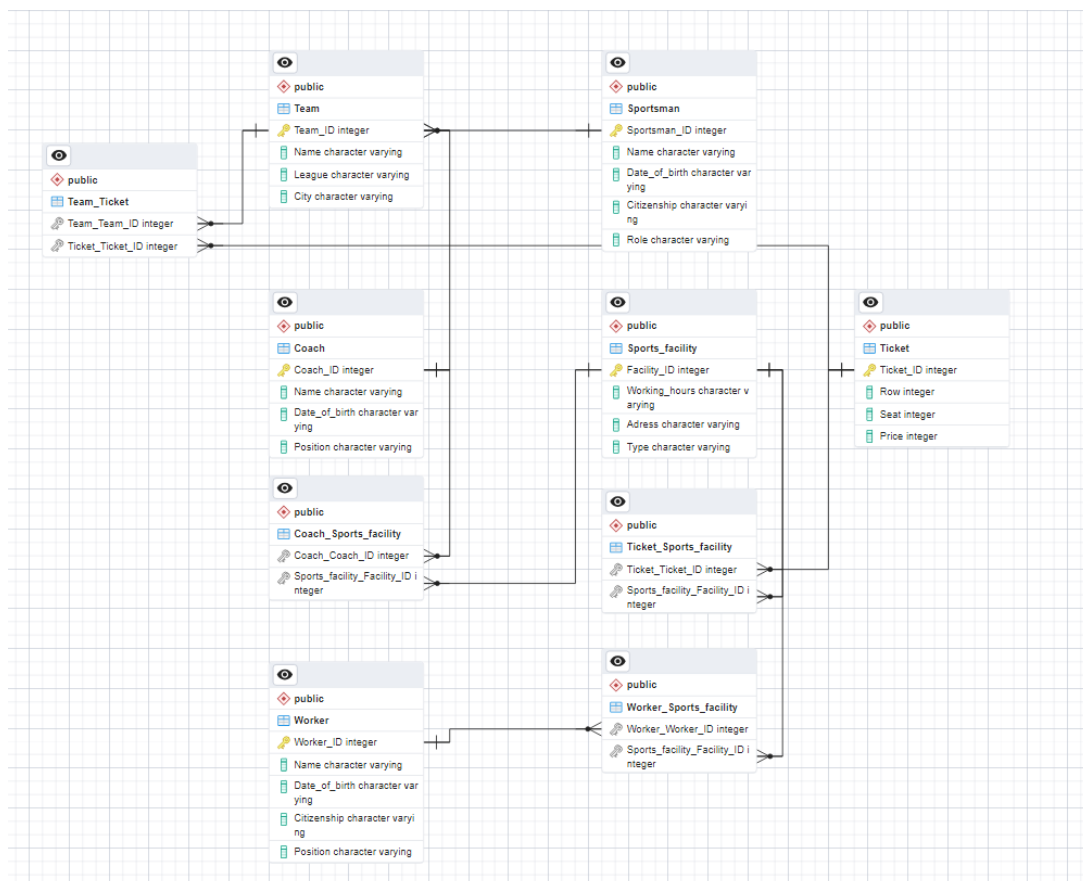
Проверила:
Куприянова Д.В.

Минск 2023

ER-диаграмма «Аэропорт» 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".

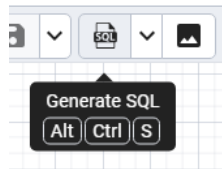
4 – Тренировка

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

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

1. Создание таблиц

Для создания таблиц необходимо выполнить ряд SQL-запросов которые автоматически генерируются по нажатию кнопки “Generate SQL”:

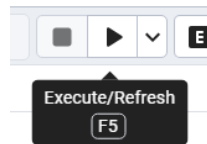


В результате генерируется последовательность SQL-запросов вида:

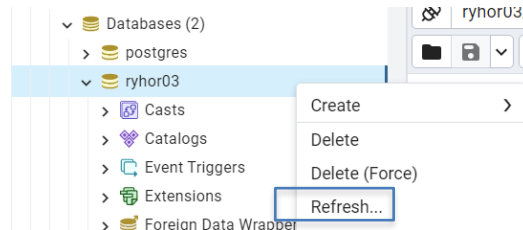
```
CREATE TABLE IF NOT EXISTS public."Team"
(
    "Team_ID" integer,
    "Name" character varying,
    "League" character varying,
    "City" character varying,
    PRIMARY KEY ("Team_ID")
);

CREATE TABLE IF NOT EXISTS public."Sportsman"
(
    "Sportsman_ID" integer,
    "Name" character varying,
    "Date_of_birth" character varying,
    "Citizenship" character varying,
    "Role" character varying,
    PRIMARY KEY ("Sportsman_ID")
);
```

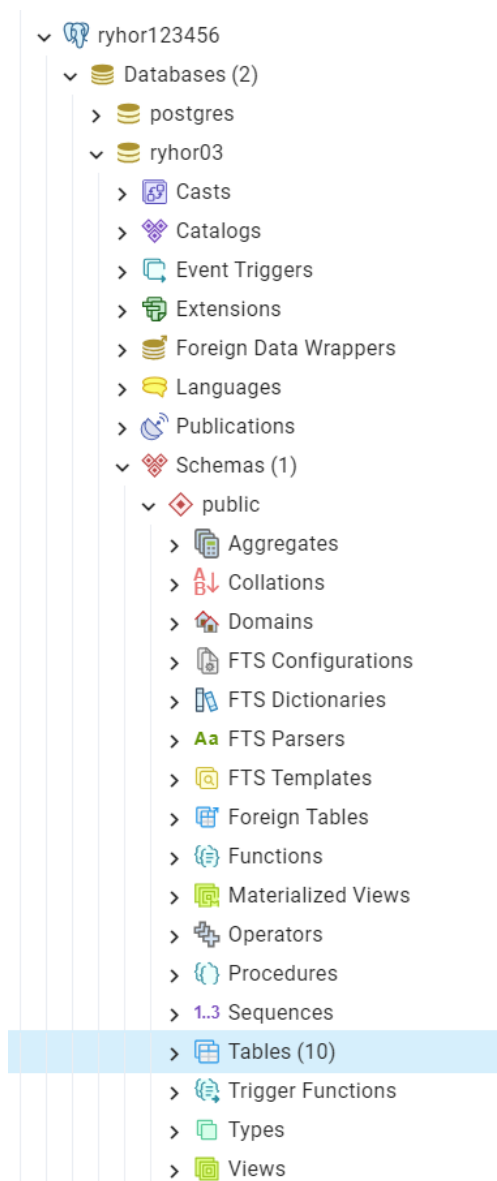
Для формирования таблиц необходимо выполнить данную последовательность запросов нажав кнопку “Execute”:



Увидеть созданные таблицы можно обновив информацию в левой панели нажав правой кнопкой мыши по рабочей базе данных с последующим нажатием кнопки “Refresh”:



Созданные таблицы можно увидеть в левой панели:



2.Заполнение таблиц

Для заполнения таблиц используется оператор INSERT, при этом можно для таблицы можно задать чтобы некоторые поля генерировались, и не добавлять их явно.

```
INSERT INTO "Sportsman" ("Sportsman_ID", "Name", "Date_of_birth", "Citizenship", "Role") VALUES
(0, 'Pinchuk Vitaly', '2002-01-11', 'Belarus', 'Forward'),
(1, 'Anas Sam', '1993-01-06', 'USA', 'Forward'),
(2, 'Kurran Kodie', '1989-12-18', 'Canada', 'Defender'),
(3, 'Koloso Alexei', '2002-01-04', 'Belarus', 'Goalkeeper'),
(4, 'Protas Alexei', '2001-01-06', 'Belarus', 'Forward'),
(5, 'Stas Andrei', '1988-10-18', 'Belarus', 'Forward'),
(6, 'Kuznetsov Sergei', '2002-05-14', 'Belarus', 'Forward'),
(7, 'Merkley Nick', '1997-05-23', 'Canada', 'Forward'),
(8, 'Liamkin Nikita', '1996-02-06', 'Russia', 'Defender'),
(9, 'Safonov Ilia', '2001-05-30', 'Russia', 'Forward'),
(10, 'Tolstushko Vsevolod', '1993-05-31', 'Ukraine', 'Defender'),
(11, 'Borodai Denis', '2002-07-10', 'Ukraine', 'Forward'),
(12, 'Kostitsyn Sergei', '1987-03-20', 'Belarus', 'Forward'),
(13, 'Kudryavtsev Sergei', '1995-04-05', 'Kazakhstan', 'Goalkeeper'),
(14, 'Lipski Mikita', '2003-01-28', 'Belarus', 'Forward');
```

Заполнение таблицу “Sportsman”

Для добавления записей необходимо выделить запрос и нажать кнопку “Execute”.

Проверить добавленные данные можно с помощью оператора SELECT.

```
SELECT * FROM public."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

Заполним все остальные таблицы аналогичным образом.

```
INSERT INTO "Coach" ("Coach_ID", "Name", "Date_of_birth", "Position") VALUES
(0, 'Kvartalnov Dmitry', '1966-03-25', 'Head coach'),
(1, 'Andrievski Aliaksandr', '1993-01-06', 'Coach'),
(2, 'Zhuravski Dzmitry', '1987-07-11', 'Goaltending coach'),
(3, 'Silinsh Normunds', '1983-09-12', 'Physical coach'),
(4, 'Carbery Spencer', '1981-11-09', 'Head coach'),
(5, 'Allen Scott', '1966-04-06', 'Coach'),
(6, 'Love Mitch', '1984-06-15', 'Coach'),
(7, 'Muller Kirk', '1966-02-08', 'Coach'),
(8, 'Letov Evgenii', '1976-02-22', 'Head coach'),
(9, 'Kravchenko Dmitry', '1975-05-12', 'Head coach'),
(10, 'Bakurin Aliaksandr', '1976-05-15', 'Doctor'),
(11, 'Bilyaletdinov Zinetula', '1955-03-15', 'Head coach'),
(12, 'Pringle Jamie', '1982-06-10', 'Belarus'),
(13, 'Huska Ryan', '1975-07-02', 'Head coach'),
(14, 'MacLean Cail', '1976-11-20', 'Coach');
```

```
INSERT INTO "Team" ("Team_ID", "Name", "League", "City") VALUES
(0, 'Dinamo-Mn', 'KHL', 'Minsk'),
(1, 'Metallurg-Mg', 'KHL', 'Magnitogorsk'),
(2, 'Ak-Bars', 'KHL', 'Kazan'),
(3, 'Avangard', 'KHL', 'Omsk'),
(4, 'Barys', 'KHL', 'Astana'),
(5, 'Admiral', 'KHL', 'Vladivostok'),
(6, 'Lokomotiv', 'KHL', 'Yaroslavl'),
(7, 'Sokol', 'UHL', 'Kyiv'),
(8, 'Dnepr', 'UHL', 'Kherson'),
(9, 'Metallurg-Zhl', 'Extraliga-BLR', 'Zhlobin'),
(10, 'Neman', 'Extraliga-BLR', 'Grodno'),
(11, 'Dinamo-Mol', 'Extraliga-BLR', 'Molodechno'),
(12, 'Vitebsk', 'Extraliga-BLR', 'Vitebsk'),
(13, 'Flames', 'NHL', 'Calgary'),
(14, 'Capitals', 'NHL', 'Washington');
```

```
INSERT INTO "Ticket" ("Ticket_ID", "Row", "Seat", "Price") VALUES
(0, 8, 1, 7),
(1, 1, 1, 5),
(2, 1, 2, 5),
(3, 1, 3, 5),
(4, 1, 4, 5),
(5, 1, 5, 5),
(6, 1, 6, 5),
(7, 3, 1, 6),
(8, 3, 2, 6),
(9, 3, 3, 6),
(10, 3, 4, 6),
(11, 3, 5, 6),
(12, 3, 6, 6),
(13, 3, 7, 6),
(14, 3, 8, 6);
```

```

INSERT INTO "Sports_facility" ("Facility_ID", "Working_hours", "Adress", "Type") VALUES
(0, '8-22', 'Minsk, Kolasa 38', 'Hockey Palace'),
(1, '8-22', 'Minsk, Kolasa 24', 'Hockey Palace'),
(2, '9-23', 'Minsk, Surganova 15/2', 'Swimming pool'),
(3, '8-24', 'Minsk, Rokossovskogo 44', 'Tennis Center'),
(4, '6-24', 'Minsk, P.Brovki 10', 'Stadium'),
(5, '8-24', 'Minsk, Alibegova 44', 'Sports Center'),
(6, '6-24', 'Minsk, Dzierzhynskaga 128', 'Stadium'),
(7, '6-24', 'Minsk, Nezalezhnastsi 12', 'Hockey Palace'),
(8, '6-24', 'Zhlobin, K.Marksa 5', 'Hockey Palace'),
(9, '8-23', 'Grodno, Kazachenka 32', 'Hockey Palace'),
(10, '0-24', 'Minsk, Nezalezhnastsi 44', 'Stadium'),
(11, '6-24', 'Kazan, Suvorova 32/3', 'Hockey Palace'),
(12, '0-0', 'Kyiv, Centralna 50', 'Hockey Palace'),
(13, '7-24', 'Kyiv, Mista Shalett 6', 'Hockey Palace'),
(14, '6-24', 'Gomel, Mazurava 110', 'Hockey Palace');

```

```

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

```

```

INSERT INTO "Coach_Sports_facility" ("Coach_Coach_ID", "Sports_facility_Facility_ID") VALUES
(0, 1),
(1, 1),
(2, 1),
(0, 4),
(1, 4),
(2, 4),
(0, 5),
(1, 5),
(2, 5),
(9, 8),
(10, 8),
(0, 10),
(0, 7),
(1, 7),
(2, 7);

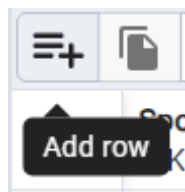
```

```
INSERT INTO "Ticket_Sports_facility" ("Ticket_Ticket_ID", "Sports_facility_Facility_ID") VALUES
(0, 1),
(1, 1),
(2, 1),
(3, 1),
(4, 1),
(5, 1),
(6, 1),
(7, 1),
(8, 1),
(9, 1),
(10, 1),
(11, 1),
(12, 1),
(13, 1),
(14, 1);
```

```
INSERT INTO "Team_Ticket" ("Team_Team_ID", "Ticket_Ticket_ID") VALUES
(0, 0),
(0, 1),
(0, 2),
(0, 3),
(0, 4),
(0, 5),
(0, 6),
(0, 7),
(0, 8),
(0, 9),
(0, 10),
(0, 11),
(0, 12),
(0, 13),
(0, 14);
```

```
INSERT INTO "Worker_Sports_facility" ("Worker_Worker_ID", "Sports_facility_Facility_ID") VALUES
(0, 0),
(1, 0),
(2, 0),
(3, 0),
(4, 0),
(5, 0),
(6, 0),
(7, 0),
(8, 0),
(9, 0),
(10, 0),
(11, 0),
(12, 0),
(13, 0),
(14, 0);
```

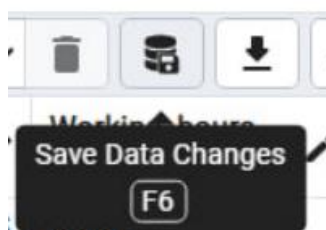

Для ручного заполнения полей в таблице в окне просмотра необходимо нажать кнопку “+” для создания записи:



После чего необходимо заполнить поля нужными значениями:

	Sportsman_ID [PK] integer	Name character varying	Date_of_birth character varying	Citizenship character varying	Role character varying
1+	15	Lipski Ryhor	2003-08-26	Belarus	Defender
2	0	Pinchuk Vitaly	2002-01-11	Belarus	Forward
3	1	Anas Sam	1993-01-06	USA	Forward
4	2	Kurran Kodie	1989-12-18	Canada	Defender
5	3	Kolosov Alexei	2002-01-04	Belarus	Goalkeeper
6	4	Protas Alexei	2001-01-06	Belarus	Forward
7	5	Stas Andrei	1988-10-18	Belarus	Forward
8	6	Kuznetsov Sergei	2002-05-14	Belarus	Forward
9	7	Merkley Nick	1997-05-23	Canada	Forward
10	8	Liamkin Nikita	1996-02-06	Russia	Defender
11	9	Safonov Ilia	2001-05-30	Russia	Forward
12	10	Tolstushko Vsevolod	1993-05-31	Ukraine	Defender
13	11	Borodai Denis	2002-07-10	Ukraine	Forward
14	12	Kostitsyn Sergei	1987-03-20	Belarus	Forward
15	13	Kudryavtsev Sergei	1995-04-05	Kazakhstan	Goalkeeper
16	14	Lipski Mikita	2003-01-28	Belarus	Forward

И нажать кнопку сохранения данных:



Заполнение таблиц вручную выглядит следующим образом:

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

После сохранения таблица приобретает следующий вид:

	Sportsman_ID [PK] integer	Name character varying	Date_of_birth character varying	Citizenship character varying	Role character varying
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
Total rows: 30 of 30		Query complete 00:00:00.107			

Заполним все оставшиеся таблицы:

	Coach_ID [PK] integer	Name character varying	Date_of_birth character varying	Position character varying
1+	29	Sinitsin Vladimir	1994-09-13	Coach
2+	28	Petrov Andres	1987-05-23	Coach
3+	27	Topalov Veselin	1969-11-04	Coach
4+	26	Hurkach Tommie	1987-12-01	Head coach
5+	25	Ng On Yee	1990-08-17	Coach
6+	24	Anisenka Aleksandr	1978-04-12	Physical coach
7+	23	Rogovoy Evgeniy	1972-03-25	Coach
8+	22	Ramanouski Uladzis...	1967-12-02	Head coach
9+	21	Chorny Andrey	1991-03-07	Physical coach
10+	20	Zubritski Maksim	1969-02-27	Goaltending coach
11+	19	Afanasiev Petr	1978-12-18	Head coach
12+	18	Reddirs Tom	1987-07-02	Goaltending coach
13+	17	Gorbach Trifon	1956-05-12	Coach
14+	16	Askerka Ivan	1978-11-26	Head coach
15+	15	Tivunov Pavel	1999-01-06	Coach
16	0	Kvartalnov Dmitry	1966-03-25	Head coach
17	1	Andrievski Aliaksandr	1993-01-06	Coach

	Team_ID [PK] integer	Name character varying	League character varying	City character varying
1+	29	Panters	NHL	Florida
2+	28	Golden Knights	NHL	Vegas
3+	27	Predators	NHL	Nashville
4+	26	Rangers	NHL	NYC
5+	25	Severstal	KHL	Cherepovets
6+	24	Spartak	KHL	Moskow
7+	23	SKA	KHL	St-Peterburg
8+	22	Lada	KHL	Tolyatti
9+	21	Sochi	KHL	Sochi
10+	20	Yunost	Extraliga-BLR	Minsk
11+	19	Brest	Extraliga-BLR	Brest
12+	18	Gomel	Extraliga-BLR	Gomel
13+	17	Lokomotiv-Orsha	Extraliga-BLR	Orsha
14+	16	Mogilev	Extraliga-BLR	Mogilev
15+	15	Lida	Extraliga-BLR	Lida
16	0	Dinamo-Mn	KHL	Minsk
17	1	Metallurg-Mg	KHL	Magnitogorsk

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

	Facility_ID [PK] integer	Working_hours character varying	Adress character varying	Type character varying
1+	29	0-24	Minsk, Brovki 6	Stadium
2+	28	0-24	Minsk, Dziazhynskaga 67	Stadium
3+	27	9-23	Minsk, Nezalezhnastsi 57	Hockey Palace
4+	26	8-22	Minsk, Kolasa 101	Hockey Palace
5+	25	0-24	Minsk, Rokossovskogo 123	Stadium
6+	24	6-24	Minsk, Surganova 32	Hockey Palace
7+	23	9-23	Kyiv, Shevchenka 23	Hockey Palace
8+	22	8-22	Minsk, Surganova 12	Swimming pool
9+	21	6-24	Grodno, Shipko 34	Hockey Palace
10+	20	8-22	Minsk, Nezalezhnastsi 100	Stadium
11+	19	6-24	Minsk, Nezalezhnastsi 120	Hockey Palace
12+	18	6-24	Minsk, Alibegova 12	Hockey Palace
13+	17	8-22	Minsk, Kolasa 21/2	Swimming pool
14+	16	9-23	Minsk, Dziazhynskaga 24	Stadium
15	0	8-22	Minsk, Kolasa 38	Hockey Palace
16	1	8-22	Minsk, Kolasa 24	Hockey Palace
17	2	9-23	Minsk, Surganova 15/2	Swimming pool
18	3	0-24	Minsk, Dziazhynskaga 44	Tennis Center

Data Output

Messages

Notifications

≡

+

📄

▼

📋

▼

🗑️

🗄️

⬇️

📈

	Worker_ID [PK] integer	Name character varying	Date_of_birth character varying	Citizenship character varying	Position character varying
1+	29	Dudnik Vasil	1991-03-12	Belarus	Handyman
2+	28	Bely Raman	1992-08-23	Belarus	Camerman
3+	27	Mihalchanka Makis...	1987-06-30	Belarus	Handyman
4+	26	Aleinik Vsevolod	1987-01-19	Belarus	Manager
5+	25	Strok Dzmitry	1964-12-09	Belarus	Cleaner
6+	24	Zaharchanka Adam	1962-11-04	Belarus	Cleaner
7+	23	Smirnou Pavel	1972-03-20	Belarus	Handyman
8+	22	Apanasevich Yegor	1968-11-19	Belarus	Handyman
9+	21	Marhun Mikalai	1998-08-12	Belarus	Camerman
10+	20	Letau Pavel	1986-11-04	Belarus	Handyman
11+	19	Borikov Egor	1990-03-25	Russia	Manager
12+	18	Ruf Aleksei	1978-12-05	Belarus	Handyman
13+	17	Paroshchanka Ryhor	1999-05-28	Belarus	Manager
14+	16	Zayats Vital	1988-07-19	Belarus	Manager
15+	15	Overchenko Vitaliy	1976-02-17	Russia	Handyman
16	0	Bedzyk Stanislav	2002-07-09	Belarus	Programmer
17	1	Kazachenka Dzmitry	1999-01-06	Belarus	Manager
18	2	Niamtsov Vitaly	1989-09-23	Belarus	Camerman
19	3	Maglich Hanna	1966-01-03	Belarus	Cleaner

4. Вывод

В результате выполнения лабораторной работы были созданы и заполнены таблицы базы данных на основе построенной ER-диаграммы.