Lab 5 COE848 - Database Programming

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In order to run program:
1. Open Netbeans IDE
2. Open 848lab5 project
3. Run basketball.java file

Opening Interface + Query list:

```
Opened database successfully
Welcome to the NBA player statistics Database!
Enter a number from 1-10 from the selecting from the following queries list:
1 - Who averaged the most points per game NBAseason and how much did they average?
2 - Who averaged the least rebounds per game in the NBA season.
3 - Which team in the Eastern conference has the most wins and how many?
4 - List all players that have at least 1 MVP and 4+ Allstar appearances.
5 - List all players that play for the Golden State Warriors
6 - List all Eastern conference Players
7 - List all players who averaged more than 20 point per game in the NBA season
8 - List all players stats for those who averaged 15+ points and 5+ assists per game in the NBA season.
9 - Who is the heaviest player in the NBA?
10 - Which team in the Western conference has the lowest wins?
0 - Quit the Program
Query:
```

Query 1 Results:

```
Query: 1
Giannis Antetokounmpo scores the most points per game with: 32.2PPG
```

Query 2 Results:

```
Query: 2
Stephen Curry is the player who managed to acquire the least rebounds with: 4.2
```

Query 3 Results:

```
Query: 3
TheMilwaukee Bucks is the Eastern conference team with the most WINS with: 66
```

Query 4 Results:

```
Query: 4
LeBron James is a player with more than 1 MVP & more than 3 All Stars.
java.sql.SQLException: database in auto-commit mode
Kevin Durant is a player with more than 1 MVP & more than 3 All Stars.
Stephen Curry is a player with more than 1 MVP & more than 3 All Stars.
Nikola Jokic is a player with more than 1 MVP & more than 3 All Stars.
Giannis Antetokounmpo is a player with more than 1 MVP & more than 3 All Stars.
```

Query 5 Results:

```
Query: 5
java.sql.SQLException: database in auto-commit mode
Stephen Curry is a player that plays for the Golden State Warriors listed under this database.
Andrew Wiggins is a player that plays for the Golden State Warriors listed under this database.
```

Query 6 Results:

```
Query: 6
Joel Embiid is an Eastern conference player.
java.sql.SQLException: database in auto-commit mode
Jayson Tatum is an Eastern conference player.
Giannis Antetokounmpo is an Eastern conference player.
```

Query 7 Results:

```
Query: 7
LeBron James is a player that averages more than 20 Points per Game.
Kevin Durant is a player that averages more than 20 Points per Game.
java.sql.SQLException: database in auto-commit mode
Stephen Curry is a player that averages more than 20 Points per Game.
Ja Morant is a player that averages more than 20 Points per Game.
Joel Embiid is a player that averages more than 20 Points per Game.
Luka Doncic is a player that averages more than 20 Points per Game.
Jayson Tatum is a player that averages more than 20 Points per Game.
Andrew Wiggins is a player that averages more than 20 Points per Game.
Nikola Jokic is a player that averages more than 20 Points per Game.
Giannis Antetokounmpo is a player that averages more than 20 Points per Game.
```

Query 8 Results:

```
Query: 8
LeBron James: 28.3PPG , 7.3APG , 6.4RPG , 1.2 BPG, 2.3 SPG
Stephen Curry: 27.7PPG , 7.7APG , 4.2RPG , 0.6 BPG, 1.7 SPG
Ja Morant: 25.4PPG , 8.4APG , 6.7RPG , 1.2 BPG, 4.1 SPG
Luka Doncic: 24.3PPG , 8.8APG , 7.2RPG , 0.6 BPG, 0.9 SPG
java.sql.SQLException: database in auto-commit mode
Jayson Tatum: 30.1PPG , 5.5APG , 8.3RPG , 1.5 BPG, 1.7 SPG
Nikola Jokic: 28.5PPG , 8.9APG , 11.1RPG , 2.8 BPG, 0.4 SPG
Giannis Antetokounmpo: 32.2PPG , 7.8APG , 11.1RPG , 4.2 BPG, 2.1 SPG
```

Query 9 Results:

```
Query: 9
Joel Embiid is the heaviest player listed, weight: 280.0
```

Query 10 Results:

```
Query: 10
The Dallas Mavericks is the western conference team with the most losses with: 64
```

Basketball Database Dump Screenshots:

```
sqlite> .dump
PRAGMA foreign_keys=OFF;
BEGIN TRANSACTION;
CREATE TABLE player(
playerID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
name VARCHAR (255)  NOT NULL,
age INTEGER NOT NULL,
position VARCHAR (255) NOT NULL,
Country VARCHAR(255) NOT NULL,
team_name VARCHAR (255) NOT NULL,
CONSTRAINT fk_team_name FOREIGN KEY (team_name) REFERENCES team (teamName)
);
INSERT INTO player VALUES(1,'LeBron James',38,'SF','USA','Los Angeles Lakers');
INSERT INTO player VALUES(2,'Kevin Durant',34,'SF','USA','Phoenix Suns');
INSERT INTO player VALUES(3,'Stephen Curry',34,'PG','USA','Golden State Warriors');
INSERT INTO player VALUES(4,'Ja Morant',23,'PG','USA','Memphis Grizzlies');
INSERT INTO player VALUES(5,'Joel Embiid',28,'C','Cameroon','Philadelphia 76ers');
INSERT INTO player VALUES(6,'Luka Doncic',24,'SF','USA','Dallas Mavericks');
INSERT INTO player VALUES(7,'Jayson Tatum',33,'SF','USA','Boston Celtics');
INSERT INTO player VALUES(8,'Andrew Wiggins',28,'SF','Canada','Golden State Warriors');
INSERT INTO player VALUES(9,'Nikola Jokic',28,'C','Serbia','Denver Nuggets');
INSERT INTO player VALUES(10,'Giannis Antetokounmpo',28,'PF','Greece','Milwaukee Bucks');
CREATE TABLE stats(
statID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
name VARCHAR (255) NOT NULL,
pointsPG REAL NOT NULL,
assistsPG REAL NOT NULL,
reboundsPG REAL NOT NULL,
blocksPG REAL NOT NULL,
stealsPG REAL NOT NULL);
```

```
INSERT INTO stats VALUES(1,'LeBron James',28.30000000000000071,7.2999999999999998223,6.4000000000000003552,1.1999999999999999555,2.2999999
999999998223);
INSERT INTO stats VALUES(2,'Kevin Durant',30.10000000000000142,4.0999999999999996447,7.5,2.6000000000000000888,1.8999999999999999111);
INSERT INTO stats VALUES(3,'Stephen Curry',27.699999999999999288,7.7000000000000001776,4.2000000000000001776,0.59999999999999997779,1.6999
999999999999555);
INSERT INTO stats VALUES(4,'Ja Morant',25.399999999999998579,8.4000000000000003552,6.7000000000000001776,1.1999999999999999555,4.099999999
9999996447);
INSERT INTO stats VALUES(5,'Joel Embiid',28.19999999999999929,1.6000000000000000888,12.199999999999999289,3.3999999999999999111,0.80000000
00000000444);
INSERT INTO stats VALUES(6,'Luka Doncic',24.30000000000000709,8.8000000000000007105,7.2000000000000001776,0.59999999999999997779,0.900000
0000000000222);
INSERT INTO stats VALUES(7,'Jayson Tatum',30.10000000000000142,5.5,8.3000000000000007105,1.5,1.6999999999999999555);
INSERT INTO stats VALUES(8,'Andrew Wiggins',21.5,2.2000000000000001776,7.4000000000000003552,1.6000000000000000888,2.2000000000000001776);

INSERT INTO stats VALUES(9,'Nikola Jokic',28.499999999999999999,8.9000000000000003552,11.099999999999999644,2.7999999999999998223,0.400000
0000000000222);
INSERT INTO stats VALUES(10,'Giannis Antetokounmpo',32.200000000000002843,7.7999999999999998223,11.099999999999999644,4.200000000000000177
6,2.1000000000000000888);
CREATE TABLE awards(
awardID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
awardee_name VARCHAR (255) NOT NULL,
MVPS INTEGER NOT NULL,
NumofAllStars INTEGER NOT NULL,
NumofChampionships INTEGER NOT NULL);
INSERT INTO awards VALUES(1,'LeBron James',4,19,4);
INSERT INTO awards VALUES(2,'Kevin Durant',1,13,2);
INSERT INTO awards VALUES(3,'Stephen Curry',2,9,4);
INSERT INTO awards VALUES(4,'Ja Morant',1,2,0);
INSERT INTO awards VALUES(5,'Joel Embiid',0,6,0);
INSERT INTO awards VALUES(6,'Luka Doncic',0,4,0);
INSERT INTO awards VALUES(7,'Jayson Tatum',0,4,0);
INSERT INTO awards VALUES(8,'Andrew Wiggins',0,1,1);
INSERT INTO awards VALUES(9,'Nikola Jokic',2,5,0);
```

```sql
CREATE TABLE physicalprofile(
profileID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
name VARCHAR (255)  NOT NULL,
height VARCHAR NOT NULL,
weight REAL NOT NULL,
Wingspan VARCHAR NOT NULL);
INSERT INTO physicalprofile VALUES(1,'LeBron James','6''8',260.0,'7''0');
INSERT INTO physicalprofile VALUES(2,'Kevin Durant','6''11',250.0,'7''4');
INSERT INTO physicalprofile VALUES(3,'Stephen Curry','6''3',190.0,'6''3.5');
INSERT INTO physicalprofile VALUES(4,'Ja Morant','6''3',180.0,'6''6');
INSERT INTO physicalprofile VALUES(5,'Joel Embiid','7''0',280.0,'7''5');
INSERT INTO physicalprofile VALUES(6,'Luka Doncic','6''7',230.0,'6''11');
INSERT INTO physicalprofile VALUES(7,'Jayson Tatum','6''8',230.0,'6''11');
INSERT INTO physicalprofile VALUES(8,'Andrew Wiggins','6''7',210.0,'6''10');
INSERT INTO physicalprofile VALUES(9,'Nikola Jokic','6''10',270.0,'7''3');
INSERT INTO physicalprofile VALUES(10,'Giannis Antetokounmpo','7''0',250.0,'7''3');
CREATE TABLE team(
teamID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
teamName VARCHAR (255) UNIQUE NOT NULL,
conference VARCHAR (255) NOT NULL,
wins INTEGER NOT NULL,
losses INTEGER  NOT NULL,
ranking INTEGER UNIQUE NOT NULL);
INSERT INTO team VALUES(1,'Los Angeles Lakers','West',54,28,5);
INSERT INTO team VALUES(2,'Phoenix Suns','West',56,26,3);
INSERT INTO team VALUES(3,'Golden State Warriors','West',64,18,2);
INSERT INTO team VALUES(4,'Memphis Grizzlies','West',50,32,6);

INSERT INTO team VALUES(5,'Philadelphia 76ers','East',55,27,4);
INSERT INTO team VALUES(6,'Dallas Mavericks','West',19,64,10);
INSERT INTO team VALUES(7,'Boston Celtics','East',49,33,7);
INSERT INTO team VALUES(8,'Toronto Raptors','East',30,52,9);
INSERT INTO team VALUES(9,'Denver Nuggets','West',40,42,8);
INSERT INTO team VALUES(10,'Milwaukee Bucks','East',66,16,1);
CREATE TABLE player_possess_profile(
playerID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
profileID INTEGER UNIQUE NOT NULL,
CONSTRAINT fkprofileID FOREIGN KEY (profileID) REFERENCES physicalprofile (profileID));
CREATE TABLE player_accumulate_stats(
playerID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
statID INTEGER UNIQUE NOT NULL,
CONSTRAINT fkstatID FOREIGN KEY (statID) REFERENCES stats (statID));
CREATE TABLE player_earn_awards(
awardID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
playerID INTEGER UNIQUE NOT NULL,
CONSTRAINT fkplayerID FOREIGN KEY (playerID) REFERENCES player (playerID));
CREATE TABLE stats_results_in_awards(
awardID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
statID INTEGER UNIQUE NOT NULL,
awardee_name VARCHAR (255) NOT NULL,
CONSTRAINT fkstatID FOREIGN KEY (statID) REFERENCES stats (statID),
CONSTRAINT fkawardee_name FOREIGN KEY (awardee_name) REFERENCES awards (awardee_name));
DELETE FROM sqlite_sequence;
INSERT INTO sqlite_sequence VALUES('player',10);
INSERT INTO sqlite_sequence VALUES('stats',10);
INSERT INTO sqlite_sequence VALUES('awards',10);
INSERT INTO sqlite_sequence VALUES('physicalprofile',10);
INSERT INTO sqlite_sequence VALUES('team',10);
COMMIT;
```

Player Table:

```
sqlite> SELECT * FROM player
   ...> ;
1|LeBron James|38|SF|USA|Los Angeles Lakers
2|Kevin Durant|34|SF|USA|Phoenix Suns
3|Stephen Curry|34|PG|USA|Golden State Warriors
4|Ja Morant|23|PG|USA|Memphis Grizzlies
5|Joel Embiid|28|C|Cameroon|Philadelphia 76ers
6|Luka Doncic|24|SF|USA|Dallas Mavericks
7|Jayson Tatum|33|SF|USA|Boston Celtics
8|Andrew Wiggins|28|SF|Canada|Golden State Warriors
9|Nikola Jokic|28|C|Serbia|Denver Nuggets
10|Giannis Antetokounmpo|28|PF|Greece|Milwaukee Bucks
```

Team Table:

```
sqlite> Select * from team
   ...> ;
1|Los Angeles Lakers|West|54|28|5
2|Phoenix Suns|West|56|26|3
3|Golden State Warriors|West|64|18|2
4|Memphis Grizzlies|West|50|32|6
5|Philadelphia 76ers|East|55|27|4
6|Dallas Mavericks|West|19|64|10
7|Boston Celtics|East|49|33|7
8|Toronto Raptors|East|30|52|9
9|Denver Nuggets|West|40|42|8
10|Milwaukee Bucks|East|66|16|1
sqlite>
```

Awards Table

```
sqlite> Select * from awards
   ...> ;
1|LeBron James|4|19|4
2|Kevin Durant|1|13|2
3|Stephen Curry|2|9|4
4|Ja Morant|1|2|0
5|Joel Embiid|0|6|0
6|Luka Doncic|0|4|0
7|Jayson Tatum|0|4|0
8|Andrew Wiggins|0|1|1
9|Nikola Jokic|2|5|0
10|Giannis Antetokounmpo|2|7|1
```

Stats Table:

```
sqlite> SELECT * FROM stats
   ...> ;
1|LeBron James|28.3|7.3|6.4|1.2|2.3
2|Kevin Durant|30.1|4.1|7.5|2.6|1.9
3|Stephen Curry|27.7|7.7|4.2|0.6|1.7
4|Ja Morant|25.4|8.4|6.7|1.2|4.1
5|Joel Embiid|28.2|1.6|12.2|3.4|0.8
6|Luka Doncic|24.3|8.8|7.2|0.6|0.9
7|Jayson Tatum|30.1|5.5|8.3|1.5|1.7
8|Andrew Wiggins|21.5|2.2|7.4|1.6|2.2
9|Nikola Jokic|28.5|8.9|11.1|2.8|0.4
10|Giannis Antetokounmpo|32.2|7.8|11.1|4.2|2.1
sqlite> |
```

Physical Profile Table:

```
sqlite> SELECT * FROM physicalprofile;
1|LeBron James|6'8|260.0|7'0
2|Kevin Durant|6'11|250.0|7'4
3|Stephen Curry|6'3|190.0|6'3.5
4|Ja Morant|6'3|180.0|6'6
5|Joel Embiid|7'0|280.0|7'5
6|Luka Doncic|6'7|230.0|6'11
7|Jayson Tatum|6'8|230.0|6'11
8|Andrew Wiggins|6'7|210.0|6'10
9|Nikola Jokic|6'10|270.0|7'3
10|Giannis Antetokounmpo|7'0|250.0|7'3
sqlite>
```

In addition, junction tables based off relationships between standard entities were created (fixed from previous lab errors):

```
CREATE TABLE player_possess_profile(
playerID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
profileID INTEGER UNIQUE NOT NULL,
CONSTRAINT fkprofileID FOREIGN KEY (profileID) REFERENCES physicalprofile (profileID));
CREATE TABLE player_accumulate_stats(
playerID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
statID INTEGER UNIQUE NOT NULL,
CONSTRAINT fkstatID FOREIGN KEY (statID) REFERENCES stats (statID));
CREATE TABLE player_earn_awards(
awardID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
playerID INTEGER UNIQUE NOT NULL,
CONSTRAINT fkplayerID FOREIGN KEY (playerID) REFERENCES player (playerID));
CREATE TABLE stats_results_in_awards(
awardID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
statID INTEGER UNIQUE NOT NULL,
awardee_name VARCHAR (255) NOT NULL,
CONSTRAINT fkstatID FOREIGN KEY (statID) REFERENCES stats (statID),
CONSTRAINT fkawardee_name FOREIGN KEY (awardee_name) REFERENCES awards (awardee_name));
```

```
CREATE TABLE player_possess_profile(
playerID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
profileID INTEGER UNIQUE NOT NULL,
CONSTRAINT fkprofileID FOREIGN KEY (profileID) REFERENCES physicalprofile (profileID))
;

--INSERT INTO player_possess_profile VALUES (1,1);
--INSERT INTO player_possess_profile VALUES (2,2);
--INSERT INTO player_possess_profile VALUES (3,3);
--INSERT INTO player_possess_profile VALUES (4,4);
--INSERT INTO player_possess_profile VALUES (5,5);

CREATE TABLE player_accumulate_stats(
playerID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
statID INTEGER UNIQUE NOT NULL,
CONSTRAINT fkstatID FOREIGN KEY (statID) REFERENCES stats (statID))
;

--INSERT INTO player_accumulate_stats VALUES (1,1);
--INSERT INTO player_accumulate_stats VALUES (2,2);
--INSERT INTO player_accumulate_stats VALUES (3,3);
--INSERT INTO player_accumulate_stats VALUES (4,4);
--INSERT INTO player_accumulate_stats VALUES (5,5);

CREATE TABLE player_earn_awards(
awardID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
playerID INTEGER UNIQUE NOT NULL,
CONSTRAINT fkplayerID FOREIGN KEY (playerID) REFERENCES player (playerID))
;

--INSERT INTO player_earn_awards VALUES (1,1);
--INSERT INTO player_earn_awards VALUES (2,2);
--INSERT INTO player_earn_awards VALUES (3,3);
--INSERT INTO player_earn_awards VALUES (4,4);
--INSERT INTO player_earn_awards VALUES (5,5);

CREATE TABLE stats_results_in_awards(
awardID INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
statID INTEGER UNIQUE NOT NULL,
awardee_name VARCHAR (255) NOT NULL,
CONSTRAINT fkstatID FOREIGN KEY (statID) REFERENCES stats (statID),
CONSTRAINT fkawardee_name FOREIGN KEY (awardee_name) REFERENCES awards (awardee_name))
;

--INSERT INTO stats_results_in_awards VALUES (1,1);
--INSERT INTO stats_results_in_awards VALUES (2,2);
--INSERT INTO stats_results_in_awards VALUES (3,3);
--INSERT INTO stats_results_in_awards VALUES (4,4);
--INSERT INTO stats_results_in_awards VALUES (5,5);
```
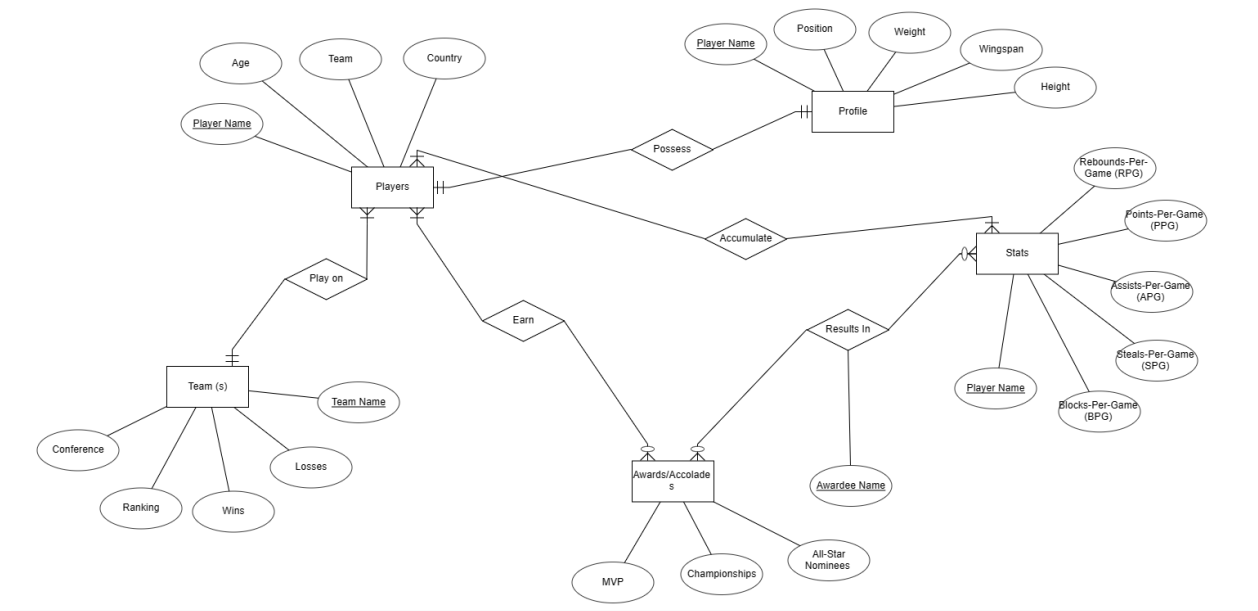
The ER diagram was also adjusted to fix a few mistakes and to match that of the database design:

Queries

1) Who averaged the most points per game NBAseason and how much did they average?

```
sqlite>            SELECT Max(pointsPG), name FROM stats;
32.2|Giannis Antetokounmpo
sqlite>
```

2) Who averaged the least rebounds per game in the NBA season?

```
sqlite> Select Min (reboundsPG), name from stats;
4.2|Stephen Curry
sqlite>
```

3) Which team in the Eastern conference has the most wins and how many?

```
sqlite> Select max (wins), teamname from team;
66|Milwaukee Bucks
```

4)List all players that have at least 1 MVP and 4+ Allstar appearances.

```
sqlite> Select name from awards where MVPS >=1 AND NumofAllStars >3;
LeBron James
Kevin Durant
Stephen Curry
Nikola Jokic
Giannis Antetokounmpo
```

5) List all players that play for the Golden State Warriors

```
sqlite> SELECT name from player where Team = 'Golden State Warriors';
Stephen Curry
Andrew Wiggins
```

6) List all Eastern conference Players

```
sqlite> Select x.name from player x, team y Where y.conference = 'East' AND y.teamName
= x.Team;
Joel Embiid
Jayson Tatum
Giannis Antetokounmpo
```

7) List all players who averaged more than 20 point per game in the NBA season.

```
sqlite> Select name From stats Where pointsPG>20;
LeBron James
Kevin Durant
Stephen Curry
Ja Morant
Joel Embiid
Luka Doncic
Jayson Tatum
Andrew Wiggins
Nikola Jokic
Giannis Antetokounmpo
sqlite>
```

8) List all players stats for those who averaged 15+ points and 5+ assists

per game in the NBA season.

```
sqlite>  Select * From stats Where pointsPG>15 AND assistsPG>=5;
LeBron James|28.3|7.3|6.4|1.2|2.3
Stephen Curry|27.7|7.7|4.2|0.6|1.7
Ja Morant|25.4|8.4|6.7|1.2|4.1
Luka Doncic|24.3|8.8|7.2|0.6|0.9
Jayson Tatum|30.1|5.5|8.3|1.5|1.7
Nikola Jokic|28.5|8.9|11.1|2.8|0.4
Giannis Antetokounmpo|32.2|7.8|11.1|4.2|2.1
sqlite>
```

9) Who is the heaviest player in the NBA?

```
sqlite> select name, MAX(weight) from physicalprofile;
Joel Embiid|280.0
```

10) Which team in the Western conference has the lowest wins?

```
sqlite>  Select teamName, wins, Max(losses)  From team where conference = 'West';
Dallas Mavericks|19|64
sqlite>
```