COMS W4111.001-Introduction to Databases

Project Part 2

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NBA Shots and Players Database

PostgreSQL account name: jl5521

PGPASSWORD=6447 psql -U jl5521 -h 35.231.103.173 -d proj1part2

The updated SQL schema is in the appendix

Test Query :

Note: The NBA player and team seasonal data used in this project is from the regular season 2014-2015, the shot data is limited from games in 2015/3/1 to 2015/3/4

Find players whose salary is 4 times higher than league average

SELECT p1.player_name, p1.team_name, p1.salary from players p1, players p2

group by p1.player_name, p1.team_name, p1.salary

having p1.salary > avg(p2.salary) * 4

order by p1.salary DESC;

```
proj1part2=> SELECT p1.player_name, p1.team_name, p1.salary from players p1, players p2
proj1part2-> group by p1.player_name, p1.team_name, p1.salary
proj1part2-> having p1.salary > avg(p2.salary) * 4
proj1part2-> order by p1.salary DESC;
   player_name   |      team_name      |   salary
-----------------+---------------------+-------------
 Kobe Bryant     | Los Angeles Lakers  | 25000000.00
 LeBron James    | Cleveland Cavaliers | 22970500.00
 Carmelo Anthony | New York Knicks     | 22875000.00
 Dwight Howard   | Houston Rockets     | 22359364.00
(4 rows)
```

Rank the total salary for all teams and select 5 highest ones

SELECT sum(salary) as total_salary, team_name from players

group by team_name

order by sum(salary) DESC

limit 5;

```
proj1part2=> SELECT sum(salary) as total_salary, team_name from players
proj1part2-> group by team_name
proj1part2-> order by sum(salary) DESC
proj1part2-> limit 5;
 total_salary |       team_name
--------------+-----------------------
 118973387.06 | Oklahoma City Thunder
 109945894.08 | Miami Heat
 105947363.18 | Los Angeles Clippers
 100703375.12 | Cleveland Cavaliers
  98828748.12 | Houston Rockets
(5 rows)
```

Find who are the top 10 players making the highest number of shots (for our data imported, the shot time range is limited to 2015/3/1 to 2015/3/4, not entire season)

select player_name, count(shot_id) as num_of_shot from shot_to_player, players

where player_id = shooter_id

group by player_id

order by count(shot_id) DESC

limit 10;

```
proj1part2=> select player_name, count(shot_id) as num_of_shot from shot_to_player, players
proj1part2-> where player_id = shooter_id
proj1part2-> group by player_id
proj1part2-> order by count(shot_id) DESC
proj1part2-> limit 10;
    player_name    | num_of_shot
-------------------+-------------
 LeBron James      |          74
 Chris Paul        |          68
 JJ Redick         |          56
 Rudy Gay          |          49
 LaMarcus Aldridge |          46
 Isaiah Thomas     |          45
 Tyreke Evans      |          43
 Aaron Brooks      |          40
 Kevin Love        |          39
 Luc Mbah a Moute  |          38
(10 rows)
```

Appendix: SQL Schema

```sql
/* create table for entity news */
create table News(
    news_id varchar(16),
    news_title text,
    new_content text,
    news_date date,
    primary key (news_id)
    );

/* create table for many-to-many relationship of news related to players */
create table News_to_Players(
    news_id varchar(16),
    player_id varchar(16),
    primary key (news_id,player_id),
    foreign key (player_id) references Players,
    foreign key (news_id) references News
    );

/* create table for entity players */
create table Players(
    player_id varchar(16),
    player_name varchar(40),
    team_name varchar(40) not null,/* every player should has a team */
    player_position varchar(8),
    height numeric(8,2),
    weight numeric(8,2),
    block numeric(8,2),
    rebounds numeric(8,2),
    assists numeric(8,2),
    steals numeric(8,2),
    twopoint_shot_percentage numeric(8,2),
    threepoint_shot_percentage numeric(8,2),
    start_year numeric(4,0) check (start_year>1950 and start_year<2100),
    salary numeric(16,2),
    primary key (player_id)
    );

create table Players_to_Team(
    player_id varchar(16),
    team_name varchar(40),
    primary key player_id,
    foreign key (team_name) references Teams,
    foreign key (player_id) references Players
    );
```

```sql
/* create table for entity players */
create table Teams
(
    team_name varchar(40),
    found_year numeric(4,0) check (found_year>1900 and found_year<2100),
    city varchar(40),
    state varchar(40),
    primary key (team_name)
    );

/* create table for entity coaches */
create table Coaches(
    coach_id varchar(16),
    coach_name varchar(40),
    start_year numeric(4,0) check (start_year>1900 and start_year<2100),
    number_of_champs int check (number_of_champs>=0),
    primary key (coach_id)
    );

create table Coach_to_Team(
    team_name varchar(40),
    coach_id varchar(16) not null,
    primary key (team_name),
    foreign key (coach_id) references Coaches, unique(coach_id),
    foreign key (team_name) references Teams
    );

/* create table for entity stadiums */
create table Stadiums
(
    stadium_name varchar(40),
    size numeric(8,0),
    stadium_location varchar(40) not null,
    primary key (stadium_name)
    );

create table Stadium_to_team(
    stadium_name varchar(40) not null,
    team_name varchar(40),
    primary key (team_name),
    foreign key (stadium_name) references Stadiums,
    foreign key (team_name) references Teams
    );

/* create table for entity games */
create table Games
(
    game_id varchar(16),
    game_date date,
    stadium_name varchar(20),
    final_margin int,
```

```
    winner char(4) check (winner in ('home','away')),
    primary key (game_id)
    );


create table Game_to_Team(
    game_id varchar(16),
    home_team_name varchar(40) not null,
    away_team_name varchar(40) not null,
    primary key (game_id),
    foreign key (game_id) references Games,
    foreign key (home_team_name) references Teams,
    foreign key (away_team_name) references Teams
    );

create table Shots
(
    shot_id varchar(16),
    shot_distance numeric(8,2),
    time_clock numeric(8,2) check (time_clock>=0 and time_clock<=24) , /
    shot_result boolean,
    quarter numeric(1,0) check (quarter in (1,2,3,4,6,7,8,9)),
    primary key (shot_id)
    );


create table Shot_to_Player(
    shot_id varchar(16),
    shooter_id varchar(16) not null,
    defender_id varchar(16) not null,
    defender_distance numeric(8,2),
    primary key (shot_id),
    foreign key (shot_id) references Shots,
    foreign key (shooter_id) references Players,
    foreign key (defender_id) references Players
    );

create table Shot_to_Game(
    shot_id varchar(16),
    game_id varchar(16) not null,
    primary key (shot_id),
    foreign key (game_id) references Games,
    foreign key (shot_id) references Shots
    );
```