CSIS3300 Database II GROUP PROJECT

Soccer League 2020-2022 Matches

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ABOUT THE

LEAGUE

This soccer league simulates the English Premier League (EPL), which is one of the highest level men's football league system in worldwide.

Clubs in the same league must follow home and away match structure to compete with all other clubs to be the champion of the season.

At the end of the season, the last three of scoreboard will be relegated to the Champion League in coming season.



SOCCER LEAGUE STRUCTURE

01

REGULAR MATCHES

Clubs must complete home and away games with others in a season

02

20 SOCCER CLUBS

20 clubs from different provinces in US will fight for the champion trophy

03

SEASON DURATION

The season starts from August this year to July next year

04

PROMOTION & RELEGATION

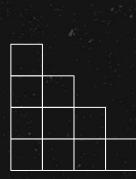
Last three on the scoreboard will be relegated to the Champion League

OUR DATABASE PHILOSOPHY

There are three directions when we are design the database structure and content

- Star Schema
- Focusing on team-side data and content
- All significant match data will be included in the collection

And the most important thing: the audience won't miss the point of your presentation





DATABASE COMPONENTS (THE 7Ws)



WHO

Clubs information:

Club name | Club Players | Manager | Chairman | Owner





Match category:

League match



HOW MUCH

Match results (for both home and away clubs):

Goal for | Goal against | Goal difference |

Result (win/loss/draw)|

Penalty | Yellow Card | Red card |

Points



WHEN

Match time and season details:

Match date | Match time | League season

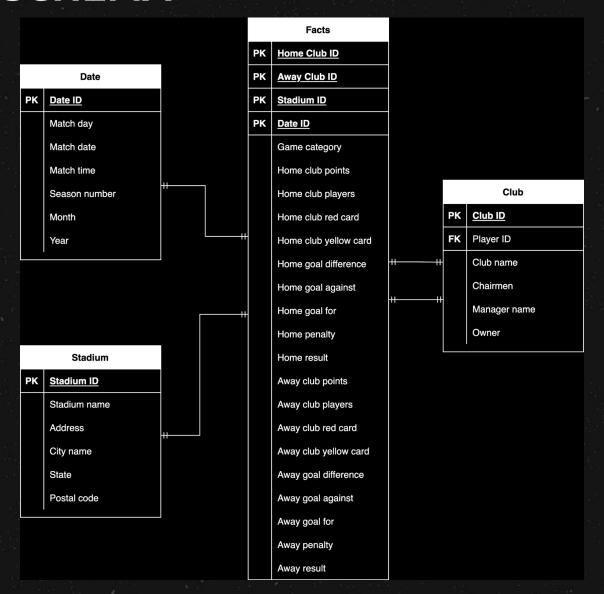


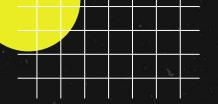


Stadium details:

Stadium name | Address | City | State |
Postal code

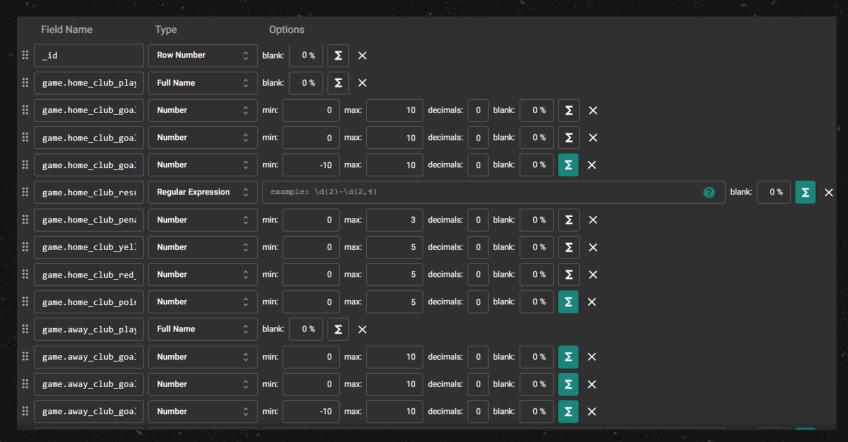
DATABASE SCHEMA





Mockaroo

https://www.mockaroo.com/25013360



MongoDB

mongodb+srv://nikhil:read123@csis3300.1ic7aoi.mongodb.net/test

```
Enable Query Assist Pin All Results 🗳 Clear Raw Shell Output 🔞 Restart Mongo Shell
Raw Shell Output | Find Query (line 1) ×
                            Documents 1 to 50
                                   : NumberInt(0),
NumberInt(0),
```

8

Q: How many times did each club win as a home team in season 2020/21?

```
db.MatchResult.aggregate([
    // match the season to 2020/21 and the result of win
    {$match: {"date.season": "2020/21", "game.home_club_result": "win" }},
    // get the number of wins that is grouped by club's name
    {$group: {_id: "$home_club.club_name" , num_of_wins: {$sum: 1}}},
    // sort by descending order
    {$sort: {"num_of_wins":-1}}
]);
```

```
{
    "_id" : "Wolves",
    "num_of_wins" : 7.0
}
{
    "_id" : "Chelsea",
    "num_of_wins" : 6.0
}
{
    "_id" : "Leicester",
    "num_of_wins" : 6.0
}
```

```
{
    "_id" : "Aston Villa",
    "num_of_wins" : 6.0
}
{
    "_id" : "West Ham",
    "num_of_wins" : 5.0
}
{
    "_id" : "Spurs",
    "num_of_wins" : 4.0
}
```

Q: How many yellow cards did each club get as a home team in season 2020/21?

```
db.MatchResult.aggregate([
    // match the season to 2020/21
    {$match: {"date.season": "2020/21" }},
    // get the sum of cards that is grouped by club's name
    {$group: {_id: "$home_club.club_name", sum_card: {$sum: "$game.home_club_yellow_card" }},
    // sort by descending order
    {$sort: {"sum_card":-1}}
]);
```

```
"_id": "Burnley",
   "sum_card": NumberInt(33)
}

{
   "_id": "Brighton",
   "sum_card": NumberInt(32)
}

{
   "_id": "West Ham",
   "sum_card": NumberInt(30)
}
```

```
"_id" : "Wolves",
    "sum_card" : NumberInt(26)
}

"_id" : "Everton",
    "sum_card" : NumberInt(26)
}

"_id" : "Man Utd",
    "sum_card" : NumberInt(25)
}
```

Q: Which Away Club got the most penalty in season 2020/21?

Result:

```
"_id" : "Brentford",
    "sum_penalty" : NumberInt(27)
}
```

Q. How many goals did each match have in season 2020/21?

```
db.MatchResult.aggregate([{
   $match: {"date.season": "2020/21"}},
   { $project: { id: {home club: "$home club.club name",
     away club: "$away club.club name", stadium: "$stadium.stadium name",
     date: "$date.match date"}, sum home goals: {$sum: "$game.home club goal for"},
     sum away goals: {$sum: "$game.away club goal for"},
     sum total goals: {\$sum: ["\$qame.home club goal for", "\$qame.away club goal for"]}}},
   // sort by descending order
   {\$sort:{"sum total goals":-1}}
 art of the result:
  " id" :
      "home club" : "Brighton",
                                                            "away club" : "Spurs",
      "away club" : "Norwich",
      "stadium" : "leo",
                                                            "stadium" : "auctor gravida sem",
      "date" : "2020/10/12"
                                                            "date" : "2021/05/25"
   "sum home goals" : NumberInt(10),
                                                        "sum home goals" : NumberInt(10),
  "sum away goals" : NumberInt(10),
                                                        "sum away goals" : NumberInt(10),
  "sum total goals" : NumberInt(20)
                                                        "sum total goals" : NumberInt(20)
```

Q. What is the largest goal differences resulted in 2020/21 season?

```
" id" : {
                                       "home club" : "Southampton",
                                                                                    "home club" : "Aston Villa",
    "away club" : "Spurs",
                                       "away club" : "Southampton",
                                                                                    "away club" : "Crystal Palace",
                                       "stadium" : "posuere cubilia curae",
                                                                                    "stadium" : "diam cras",
   "stadium" : "ut erat",
    "date" : "2021/03/21"
                                       "date": "2021/02/20"
                                                                                    "date": "2021/02/26"
"home goals" : 0,
                                                                                "home goals" : 0,
                                   "home goals" : 0,
"away goals" : 10,
                                   "away goals" : 10,
                                                                                "away goals" : 10,
"absolute goal difference" : 10
                                   "absolute goal difference" : 10
                                                                                "absolute goal difference" : 10
```

Q. Which three home clubs scored the least in season 2021/22?

```
db.MatchResult.aggregate([
    // match the season to 2021/22
    {$match: {"date.season": "2021/22"}},
    // get those three clubs scored the least in the season
    {$group:
          {_id: {home_club: "$home_club.club_name"}, points: {$sum:"$game.home_club_points"}}},
    // sort the result by ascending points, then by home club name
    {$sort: {"points": 1, "home_club.club_name":1}},
    // limit the search result to the least 3 clubs
    {$limit: 3 }
]);
```

Result:

```
{
    "_id" : {
        "home_club" : "Chelsea"
    },
    "points" : 4
}
```

```
"_id" : {
    "home_club" : "West Ham"
},
    "points" : 4
}
```

```
"_id" : {
    "home_club" : "Crystal Palace"
    },
    "points" : 6
}
```

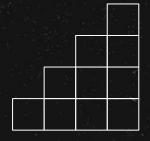
Q. Which stadium has the most home club wins in season 2021/22?

```
db.MatchResult.aggregate([
    // match the season to 2021/22 and home club's result is win
    {$match: {"date.season": "2021/22", "game.home_club_result": {$in: ["win"]}}},
    // group the sum of wins by stadium
    {$group: {_id: "$stadium.stadium_name", num_of_wins: {$sum: 1}}},
    // sort the stadium by descending order
    {$sort: {"num_of_wins":-1}}
]);
```



Thank you!





APPENDIX

Mockaroo link:

https://www.mockaroo.com/25013360

MongoDB link:

mongodb+srv://nikhil:read123@csis3300.1ic7aoi.mongodb.net/test

Username: nikhil

Password: read123