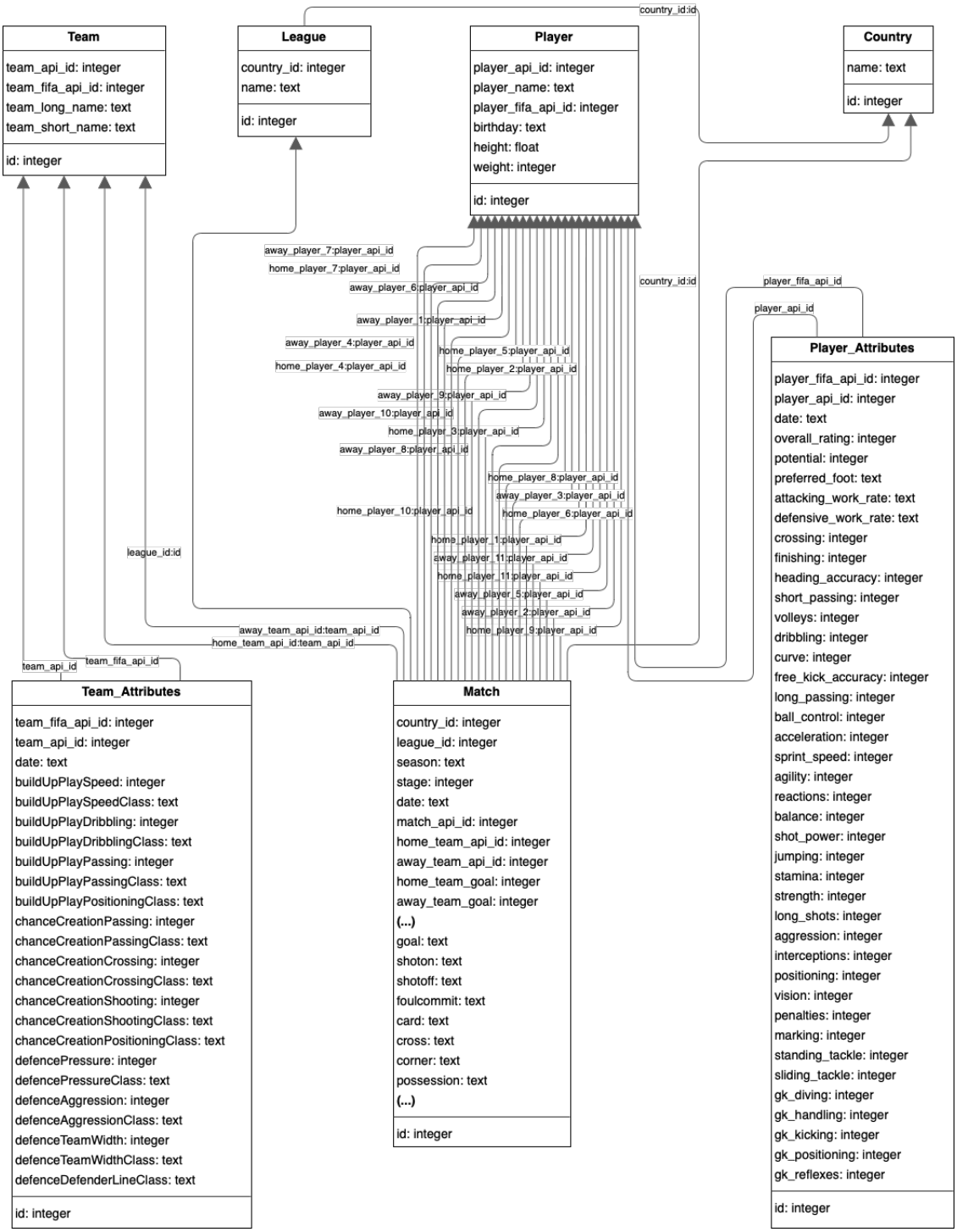
queries-practice-2

August 18, 2025

1 SQL Queries (Part II)



E-R Diagram

[2]:
```
!wget -c https://github.com/bdist/is-labs-data/raw/refs/heads/main/soccer/
↪database.sqlite?download= -O /home/jovyan/data/database.sqlite
```

```
--2025-08-07 16:17:07--  https://github.com/bdist/is-labs-
data/raw/refs/heads/main/soccer/database.sqlite?download=
Resolving github.com (github.com)… 140.82.121.4
connected. to github.com (github.com)|140.82.121.4|:443…
HTTP request sent, awaiting response… 301 Moved Permanently
Location: https://github.com/bdist/is-
data/raw/refs/heads/main/soccer/database.sqlite?download= [following]
--2025-08-07 16:17:08--  https://github.com/bdist/is-
data/raw/refs/heads/main/soccer/database.sqlite?download=
Reusing existing connection to github.com:443.
302 Foundest sent, awaiting response…
Location: https://media.githubusercontent.com/media/bdist/is-
data/refs/heads/main/soccer/database.sqlite?download=true [following]
--2025-08-07 16:17:08--  https://media.githubusercontent.com/media/bdist/is-
data/refs/heads/main/soccer/database.sqlite?download=true
185.199.108.133, 185.199.109.133, 185.199.110.133, …rcontent.com)…
Connecting to media.githubusercontent.com
(media.githubusercontent.com)|185.199.108.133|:443… connected.
200 OKequest sent, awaiting response…
Length: 317698048 (303M) [application/octet-stream]
Saving to: ‘/home/jovyan/data/database.sqlite’

/home/jovyan/data/d  34%[=====>              ] 103.91M   849KB/s    in 2m 4s

2025-08-07 16:19:17 (861 KB/s) - Read error at byte 108953600/317698048
(Connection reset by peer). Retrying.

--2025-08-07 16:19:18--  (try: 2)
https://media.githubusercontent.com/media/bdist/is-
data/refs/heads/main/soccer/database.sqlite?download=true
Connecting to media.githubusercontent.com
(media.githubusercontent.com)|185.199.108.133|:443… connected.
HTTP request sent, awaiting response… 206 Partial Content
Length: 317698048 (303M), 208744448 (199M) remaining [application/octet-stream]
Saving to: ‘/home/jovyan/data/database.sqlite’

/home/jovyan/data/d  36%[++++++>             ] 109.49M   402KB/s    in 8.4s

2025-08-07 16:19:26 (679 KB/s) - Read error at byte 114810240/317698048
(Connection reset by peer). Retrying.

--2025-08-07 16:19:28--  (try: 3)
https://media.githubusercontent.com/media/bdist/is-
data/refs/heads/main/soccer/database.sqlite?download=true
Connecting to media.githubusercontent.com
(media.githubusercontent.com)|185.199.108.133|:443… connected.
HTTP request sent, awaiting response… 206 Partial Content
Length: 317698048 (303M), 202887808 (193M) remaining [application/octet-stream]
```

```
Saving to: ‘/home/jovyan/data/database.sqlite’

/home/jovyan/data/d  40%[+++++++>            ] 122.26M   843KB/s    in 18s

2025-08-07 16:19:45 (728 KB/s) - Read error at byte 128199556/317698048
(Connection reset by peer). Retrying.

--2025-08-07 16:19:48--  (try: 4)
https://media.githubusercontent.com/media/bdist/is-
data/refs/heads/main/soccer/database.sqlite?download=true
Connecting to media.githubusercontent.com
(media.githubusercontent.com)|185.199.108.133|:443… connected.
HTTP request sent, awaiting response… 206 Partial Content
Length: 317698048 (303M), 189498492 (181M) remaining [application/octet-stream]
Saving to: ‘/home/jovyan/data/database.sqlite’

/home/jovyan/data/d  43%[++++++++            ] 131.82M   892KB/s    in 11s

2025-08-07 16:19:59 (906 KB/s) - Read error at byte 138221788/317698048
(Connection reset by peer). Retrying.

--2025-08-07 16:20:03--  (try: 5)
https://media.githubusercontent.com/media/bdist/is-
data/refs/heads/main/soccer/database.sqlite?download=true
connected. to media.githubusercontent.com
(media.githubusercontent.com)|185.199.108.133|:443…
HTTP request sent, awaiting response… 206 Partial Content
Length: 317698048 (303M), 179476260 (171M) remaining [application/octet-stream]
Saving to: ‘/home/jovyan/data/database.sqlite’

/home/jovyan/data/d  45%[++++++++>           ] 137.50M   901KB/s    in 8.5s

2025-08-07 16:20:11 (688 KB/s) - Read error at byte 144183880/317698048
(Connection reset by peer). Retrying.

--2025-08-07 16:20:16--  (try: 6)
https://media.githubusercontent.com/media/bdist/is-
data/refs/heads/main/soccer/database.sqlite?download=true
Connecting to media.githubusercontent.com
(media.githubusercontent.com)|185.199.108.133|:443… connected.
HTTP request sent, awaiting response… 206 Partial Content
Length: 317698048 (303M), 173514168 (165M) remaining [application/octet-stream]
Saving to: ‘/home/jovyan/data/database.sqlite’

/home/jovyan/data/d  79%[+++++++++=====>     ] 239.58M   616KB/s    in 2m 8s

2025-08-07 16:22:21 (816 KB/s) - Read error at byte 251222684/317698048
(Connection reset by peer). Retrying.
```

```
--2025-08-07 16:22:27--  (try: 7)
https://media.githubusercontent.com/media/bdist/is-
data/refs/heads/main/soccer/database.sqlite?download=true
Connecting to media.githubusercontent.com
(media.githubusercontent.com)|185.199.108.133|:443… connected.
206 Partial Contentawaiting response…
Length: 317698048 (303M), 66475364 (63M) remaining [application/octet-stream]
Saving to: ‘/home/jovyan/data/database.sqlite’

/home/jovyan/data/d  85%[+++++++++++++++=>   ] 258.79M   894KB/s    in 25s

2025-08-07 16:22:59 (779 KB/s) - Read error at byte 271363272/317698048
(Connection reset by peer). Retrying.

--2025-08-07 16:23:06--  (try: 8)
https://media.githubusercontent.com/media/bdist/is-
data/refs/heads/main/soccer/database.sqlite?download=true
Connecting to media.githubusercontent.com
(media.githubusercontent.com)|185.199.108.133|:443… connected.
206 Partial Contentawaiting response…
Length: 317698048 (303M), 46334776 (44M) remaining [application/octet-stream]
Saving to: ‘/home/jovyan/data/database.sqlite’

/home/jovyan/data/d  87%[+++++++++++++++   ] 265.36M   901KB/s    in 12s

2025-08-07 16:23:17 (566 KB/s) - Read error at byte 278247496/317698048
(Connection reset by peer). Retrying.

--2025-08-07 16:23:25--  (try: 9)
https://media.githubusercontent.com/media/bdist/is-
data/refs/heads/main/soccer/database.sqlite?download=true
Connecting to media.githubusercontent.com
(media.githubusercontent.com)|185.199.108.133|:443… connected.
HTTP request sent, awaiting response… 206 Partial Content
Length: 317698048 (303M), 39450552 (38M) remaining [application/octet-stream]
Saving to: ‘/home/jovyan/data/database.sqlite’

/home/jovyan/data/d  99%[+++++++++++++++=> ] 302.37M   910KB/s    in 43s

2025-08-07 16:24:07 (887 KB/s) - Read error at byte 317062068/317698048
(Connection reset by peer). Retrying.

--2025-08-07 16:24:15--  (try:10)
https://media.githubusercontent.com/media/bdist/is-
data/refs/heads/main/soccer/database.sqlite?download=true
Connecting to media.githubusercontent.com
(media.githubusercontent.com)|185.199.108.133|:443… connected.
```

```
206 Partial Contentawaiting response…
Length: 317698048 (303M), 635980 (621K) remaining [application/octet-stream]
Saving to: ‘/home/jovyan/data/database.sqlite’

/home/jovyan/data/d 100%[++++++++++++++++++>] 302.98M  1.07MB/s    in 0.6s

2025-08-07 16:24:16 (1.07 MB/s) - ‘/home/jovyan/data/database.sqlite’ saved
[317698048/317698048]
```

[3]:
```
%reload_ext sql
%config SqlMagic.displaycon = 0
%config SqlMagic.displaylimit = 100
%config SqlMagic.feedback = 0
%sql sqlite:////home/jovyan/data/database.sqlite --alias sqlite
```

1.1 Queries

1. What is the maximum number of goals recorded in a match? Output a single number.

[4]:
```
%%sql sqlite
SELECT
  MAX(home_team_goal + away_team_goal) AS max_total_match_goals
FROM
  MATCH;
```

[4]:
```
+-----------------------+
| max_total_match_goals |
+-----------------------+
|           12          |
+-----------------------+
```

2. List each league name and its number of teams sorted from high to low.

[6]:
```
%%sql sqlite
SELECT
  b.name,
  COUNT(*) AS count_teams
FROM
  (
    SELECT DISTINCT
      home_team_api_id,
      league_id
    FROM
      MATCH
  ) a
  LEFT JOIN league AS b ON a.league_id = b.id
GROUP BY
```

```
  league_id
ORDER BY
  count_teams DESC;
```

[6]:
```
+--------------------------+-------------+
|           name           | count_teams |
+--------------------------+-------------+
|      France Ligue 1      |      35     |
|  England Premier League  |      34     |
|     Spain LIGA BBVA      |      33     |
|      Italy Serie A       |      32     |
|  Germany 1. Bundesliga   |      30     |
| Portugal Liga ZON Sagres |      29     |
|  Netherlands Eredivisie  |      25     |
|  Belgium Jupiler League  |      24     |
|    Poland Ekstraklasa    |      22     |
| Scotland Premier League  |      17     |
| Switzerland Super League |      15     |
+--------------------------+-------------+
```

3. Who are the GoalKeepers (GK) that have played all the away games for their team? Output the `team_long_name` and `player_name` (assuming `match.away_player_1` is the goalkeeper column).

[7]:
```
%%sql sqlite
SELECT
  team_long_name,
  player_name
FROM
  (
    SELECT
      away_team_api_id,
      COUNT(*) AS total_team_away_matches,
      away_player_1
    FROM
      MATCH
    GROUP BY
      away_team_api_id
  ) a
  LEFT JOIN (
    SELECT
      away_player_1,
      COUNT(*) AS total_gk_matches
    FROM
      MATCH
    GROUP BY
      away_player_1
  ) b ON a.away_player_1 = b.away_player_1
```

```
  LEFT JOIN player AS c ON b.away_player_1 = c.player_api_id
  LEFT JOIN team AS d ON a.away_team_api_id = d.team_api_id
WHERE
  total_team_away_matches = total_gk_matches;
```

[7]:
```
+------------------------+---------------------+
|      team_long_name    |     player_name     |
+------------------------+---------------------+
|        Angers SCO      |   Ludovic Butelle   |
|     SV Darmstadt 98    |  Christian Mathenia |
|     SC Paderborn 07    |     Lukas Kruse     |
|       Norwich City     |      John Ruddy     |
|       CD Tenerife      |   Sergio Aragones   |
|  DSC Arminia Bielefeld |    Dennis Eilhoff   |
| Hércules Club de Fútbol | Juan Jesus Calatayud |
+------------------------+---------------------+
```

1.2 PART II - New Database Schema (PostgreSQL)

0. Migrate the SQLite Database to PostgreSQL Instead of writing tedious migration code ourselves, we will be using the `pgloader` CLI tool to get started quickly. The migration task is setup using a `command-file`. Lets see inside that file.

[10]:
```
!cat ./command-file.txt
```

```
load database
    from '/home/jovyan/data/database.sqlite'
    into postgresql://db:db@postgres/db

with include drop, create tables, create indexes, reset sequences,

prefetch rows = 100, max parallel create index = 1

set work_mem to '16MB', maintenance_work_mem to '512 MB';
```

[12]:
```
!pgloader ./command-file.txt
```

```
2025-08-07T16:37:55.020648Z LOG pgloader version "3.6.10~devel"
2025-08-07T16:37:55.020648Z LOG Data errors in '/tmp/pgloader/'
2025-08-07T16:37:55.020648Z LOG Parsing commands from file
#P"/home/jovyan/work/command-file.txt"
2025-08-07T16:37:55.196154Z LOG Migrating from #<SQLITE-CONNECTION
sqlite:///home/jovyan/data/database.sqlite {1006A3D4E3}>
2025-08-07T16:37:55.206478Z LOG Migrating into #<PGSQL-CONNECTION
pgsql://db@postgres:5432/db {1006A3D663}>
2025-08-07T16:38:21.591172Z LOG report summary reset
             table name     errors       rows      bytes      total time
----------------------  ---------  ---------  ---------  --------------
                  fetch          0          0                     0.000s
```

```
        fetch meta data          0         50                    0.124s
         Create Schemas          0          0                    0.000s
       Create SQL Types          0          0                    0.021s
          Create tables          0         14                    0.072s
         Set Table OIDs          0          7                    0.000s
----------------------  ---------  ---------  ---------  --------------
     player_attributes          0     183929    28.2 MB          2.911s
                player          0      11060   688.0 kB          0.145s
                league          0         11     0.3 kB          0.083s
                  team          0        296     9.5 kB          0.206s
                 match          0      25597   266.9 MB         20.899s
               country          0         11     0.1 kB          0.010s
       team_attributes          0       1451   210.4 kB          0.031s
----------------------  ---------  ---------  ---------  --------------
COPY Threads Completion          0          4                   23.831s
         Create Indexes          0         14                    0.485s
 Index Build Completion          0         14                    0.455s
       Reset Sequences           0          7                    0.134s
          Primary Keys           0          7                    0.858s
    Create Foreign Keys          0         29                    0.724s
        Create Triggers          0          0                    0.000s
       Install Comments          0          0                    0.000s
----------------------  ---------  ---------  ---------  --------------
     Total import time                 222355   296.0 MB         26.488s
```

[13]:
```
%load_ext sql
%config SqlMagic.displaycon = 0
%config SqlMagic.displaylimit = 100
%config SqlMagic.feedback = 0
%sql postgresql+psycopg://db:db@postgres/db --alias psql
```

```
The sql extension is already loaded. To reload it, use:
  %reload_ext sql
```

[14]:
```
%sqlcmd columns -t match
```

[14]:
```
+-----------------+---------+----------+-----------------------------------+---
------------+---------+
|       name      |   type  | nullable |              default              |
autoincrement | comment |
+-----------------+---------+----------+-----------------------------------+---
------------+---------+
|        id       |  BIGINT |  False   | nextval('match_id_seq'::regclass) |
True     |   None  |
|    country_id   |  BIGINT |   True   |                None               |
False    |   None  |
|    league_id    |  BIGINT |   True   |                None               |
False    |   None  |
```

```
|      season      |   TEXT  |   True   |                None                |
False     |   None  |
|      stage       |  BIGINT |   True   |                None                |
False     |   None  |
|       date       |   TEXT  |   True   |                None                |
False     |   None  |
|   match_api_id   |  BIGINT |   True   |                None                |
False     |   None  |
| home_team_api_id |  BIGINT |   True   |                None                |
False     |   None  |
| away_team_api_id |  BIGINT |   True   |                None                |
False     |   None  |
|  home_team_goal  |  BIGINT |   True   |                None                |
False     |   None  |
|  away_team_goal  |  BIGINT |   True   |                None                |
False     |   None  |
|  home_player_x1  |  BIGINT |   True   |                None                |
False     |   None  |
|  home_player_x2  |  BIGINT |   True   |                None                |
False     |   None  |
|  home_player_x3  |  BIGINT |   True   |                None                |
False     |   None  |
|  home_player_x4  |  BIGINT |   True   |                None                |
False     |   None  |
|  home_player_x5  |  BIGINT |   True   |                None                |
False     |   None  |
|  home_player_x6  |  BIGINT |   True   |                None                |
False     |   None  |
|  home_player_x7  |  BIGINT |   True   |                None                |
False     |   None  |
|  home_player_x8  |  BIGINT |   True   |                None                |
False     |   None  |
|  home_player_x9  |  BIGINT |   True   |                None                |
False     |   None  |
| home_player_x10  |  BIGINT |   True   |                None                |
False     |   None  |
| home_player_x11  |  BIGINT |   True   |                None                |
False     |   None  |
|  away_player_x1  |  BIGINT |   True   |                None                |
False     |   None  |
|  away_player_x2  |  BIGINT |   True   |                None                |
False     |   None  |
|  away_player_x3  |  BIGINT |   True   |                None                |
False     |   None  |
|  away_player_x4  |  BIGINT |   True   |                None                |
False     |   None  |
|  away_player_x5  |  BIGINT |   True   |                None                |
```

```
False     |   None  |
|  away_player_x6  |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_x7  |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_x8  |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_x9  |  BIGINT |   True   |               None               |
False     |   None  |
| away_player_x10  |  BIGINT |   True   |               None               |
False     |   None  |
| away_player_x11  |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_y1  |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_y2  |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_y3  |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_y4  |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_y5  |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_y6  |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_y7  |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_y8  |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_y9  |  BIGINT |   True   |               None               |
False     |   None  |
| home_player_y10  |  BIGINT |   True   |               None               |
False     |   None  |
| home_player_y11  |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_y1  |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_y2  |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_y3  |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_y4  |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_y5  |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_y6  |  BIGINT |   True   |               None               |
False     |   None  |
```

```
|  away_player_y7  |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_y8  |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_y9  |  BIGINT |   True   |               None               |
False     |   None  |
| away_player_y10  |  BIGINT |   True   |               None               |
False     |   None  |
| away_player_y11  |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_1   |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_2   |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_3   |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_4   |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_5   |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_6   |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_7   |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_8   |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_9   |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_10  |  BIGINT |   True   |               None               |
False     |   None  |
|  home_player_11  |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_1   |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_2   |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_3   |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_4   |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_5   |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_6   |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_7   |  BIGINT |   True   |               None               |
False     |   None  |
|  away_player_8   |  BIGINT |   True   |               None               |
```

```
False     |   None  |
|  away_player_9   |  BIGINT |   True   |                None                |
False     |   None  |
|  away_player_10  |  BIGINT |   True   |                None                |
False     |   None  |
|  away_player_11  |  BIGINT |   True   |                None                |
False     |   None  |
|       goal       |   TEXT  |   True   |                None                |
False     |   None  |
|      shoton      |   TEXT  |   True   |                None                |
False     |   None  |
|     shotoff      |   TEXT  |   True   |                None                |
False     |   None  |
|    foulcommit    |   TEXT  |   True   |                None                |
False     |   None  |
|       card       |   TEXT  |   True   |                None                |
False     |   None  |
|      cross       |   TEXT  |   True   |                None                |
False     |   None  |
|      corner      |   TEXT  |   True   |                None                |
False     |   None  |
|    possession    |   TEXT  |   True   |                None                |
False     |   None  |
|      b365h       | NUMERIC |   True   |                None                |
False     |   None  |
|      b365d       | NUMERIC |   True   |                None                |
False     |   None  |
|      b365a       | NUMERIC |   True   |                None                |
False     |   None  |
|       bwh        | NUMERIC |   True   |                None                |
False     |   None  |
|       bwd        | NUMERIC |   True   |                None                |
False     |   None  |
|       bwa        | NUMERIC |   True   |                None                |
False     |   None  |
|       iwh        | NUMERIC |   True   |                None                |
False     |   None  |
|       iwd        | NUMERIC |   True   |                None                |
False     |   None  |
|       iwa        | NUMERIC |   True   |                None                |
False     |   None  |
|       lbh        | NUMERIC |   True   |                None                |
False     |   None  |
|       lbd        | NUMERIC |   True   |                None                |
False     |   None  |
|       lba        | NUMERIC |   True   |                None                |
False     |   None  |
```

```
|       psh        | NUMERIC |   True   |                None                |
False     |   None  |
|       psd        | NUMERIC |   True   |                None                |
False     |   None  |
|       psa        | NUMERIC |   True   |                None                |
False     |   None  |
|       whh        | NUMERIC |   True   |                None                |
False     |   None  |
|       whd        | NUMERIC |   True   |                None                |
False     |   None  |
|       wha        | NUMERIC |   True   |                None                |
False     |   None  |
|       sjh        | NUMERIC |   True   |                None                |
False     |   None  |
|       sjd        | NUMERIC |   True   |                None                |
False     |   None  |
|       sja        | NUMERIC |   True   |                None                |
False     |   None  |
|       vch        | NUMERIC |   True   |                None                |
False     |   None  |
|       vcd        | NUMERIC |   True   |                None                |
False     |   None  |
|       vca        | NUMERIC |   True   |                None                |
False     |   None  |
|       gbh        | NUMERIC |   True   |                None                |
False     |   None  |
|       gbd        | NUMERIC |   True   |                None                |
False     |   None  |
|       gba        | NUMERIC |   True   |                None                |
False     |   None  |
|       bsh        | NUMERIC |   True   |                None                |
False     |   None  |
|       bsd        | NUMERIC |   True   |                None                |
False     |   None  |
|       bsa        | NUMERIC |   True   |                None                |
False     |   None  |
+------------------+---------+----------+------------------------------------+---
-----------+---------+
```

1. Functions, Stored Procedures, and Triggers Provide the SQL instructions corresponding to each of the following tasks:

1. Create a new `match_player` table to store the data for the starting players (11) for each match (currently stored in the columns `match.home_player_DD` and `match.away_player_DD`). We are going to copy the data contained in the table `match` to `match_player` but we want to use a new column for the player position `position`.

[15]:
```
%%sql psql
DROP TABLE IF EXISTS match_player;

CREATE TABLE
  match_player (
    id SERIAL,
    player_id BIGINT,
    team_id BIGINT,
    match_id BIGINT,
    league_id BIGINT,
    POSITION BIGINT,
    cond TEXT,
    PRIMARY KEY (id),
    FOREIGN KEY (player_id) REFERENCES player (player_api_id),
    FOREIGN KEY (match_id) REFERENCES MATCH (id),
    FOREIGN KEY (team_id) REFERENCES team (team_api_id),
    FOREIGN KEY (league_id) REFERENCES league (id)
  );
```

[15]:
```
++
||
++
++
```

2. Populate the new table `match_player` using the data contained in the table `match` using a function or stored procedure.

[16]:
```
%%sql psql

DELETE FROM match_player;

CREATE OR REPLACE FUNCTION populate_match_player()
RETURNS void AS $$
DECLARE
    match_row RECORD;
    i INT;
    home_player_id INT;
    away_player_id INT;
BEGIN
    FOR match_row IN SELECT * FROM match LOOP
        FOR i IN 1..11 LOOP
            EXECUTE format(
                'SELECT %I FROM match WHERE id = %L',
                format('home_player_%s', i),
                match_row.id
            ) INTO home_player_id;

            IF home_player_id IS NOT NULL THEN
```

```
                INSERT INTO match_player (player_id, team_id, league_id,␣
 ↪match_id, position, cond)
                VALUES (home_player_id, match_row.home_team_api_id, match_row.
 ↪league_id, match_row.id, i, 'home');
            END IF;

            EXECUTE format(
                'SELECT %I FROM match WHERE id = %L',
                format('away_player_%s', i),
                match_row.id
            ) INTO away_player_id;

            IF away_player_id IS NOT NULL THEN
                INSERT INTO match_player (player_id, team_id, league_id,␣
 ↪match_id, position, cond)
                VALUES (away_player_id, match_row.away_team_api_id, match_row.
 ↪league_id, match_row.id, i, 'away');
            END IF;
        END LOOP;
    END LOOP;
END;
$$ LANGUAGE plpgsql;
```

[16]:
```
++
||
++
++
```

Here we execute our function as this is the way to do it in PostgreSQL

[17]:
```
%%sql psql
SELECT
  populate_match_player ();
```

[17]:
```
+-----------------------+
| populate_match_player |
+-----------------------+
|                       |
+-----------------------+
```

Here we show the table to review if it is right

[18]:
```
%%sql psql
SELECT
  *
FROM
  match_player
LIMIT
```

```
  10;
```

[18]:
```
+----+-----------+---------+----------+-----------+----------+------+
| id | player_id | team_id | match_id | league_id | position | cond |
+----+-----------+---------+----------+-----------+----------+------+
| 1  |   39890   |   9996  |   145    |     1     |    1     | home |
| 2  |   34480   |   8635  |   145    |     1     |    1     | away |
| 3  |   38388   |   8635  |   145    |     1     |    2     | away |
| 4  |   38788   |   9996  |   145    |     1     |    3     | home |
| 5  |   26458   |   8635  |   145    |     1     |    3     | away |
| 6  |   38312   |   9996  |   145    |     1     |    4     | home |
| 7  |   13423   |   8635  |   145    |     1     |    4     | away |
| 8  |   26235   |   9996  |   145    |     1     |    5     | home |
| 9  |   38389   |   8635  |   145    |     1     |    5     | away |
| 10 |   38798   |   8635  |   145    |     1     |    6     | away |
+----+-----------+---------+----------+-----------+----------+------+
```

2. SQL Queries Consider the new `match_player` table above and write SQL queries for each of the following information needs.

1. List all the teams that 'Cristiano Ronaldo' has played for (regardless of starting position)

[19]:
```
%%sql psql
SELECT DISTINCT
  c.team_long_name
FROM
  match_player a
  LEFT JOIN player b ON a.player_id = b.player_api_id
  LEFT JOIN team c ON a.team_id = c.team_api_id
WHERE
  b.player_name = 'Cristiano Ronaldo';
```

[19]:
```
+-------------------+
|   team_long_name  |
+-------------------+
| Manchester United |
|   Real Madrid CF  |
+-------------------+
```

2. Who are the players that have played all the away games for their team? Output the `team_long_name` and `player_name`.

[20]:
```
%%sql psql
SELECT
  c.team_long_name,
  d.player_name
FROM
  (
```

```
    SELECT
      player_id,
      team_id,
      COUNT(*) AS count_ma
    FROM
      match_player
    WHERE
      cond = 'away'
    GROUP BY
      player_id,
      team_id
  ) a
  LEFT JOIN (
    SELECT
      away_team_api_id,
      COUNT(*) AS count_matches_away
    FROM
      MATCH
    GROUP BY
      away_team_api_id
  ) b ON a.team_id = b.away_team_api_id
  LEFT JOIN team c ON a.team_id = c.team_api_id
  LEFT JOIN player d ON a.player_id = d.player_api_id
WHERE
  a.count_ma = b.count_matches_away;
```

[20]:

team_long_name	player_name
CD Tenerife	Sergio Aragones
DSC Arminia Bielefeld	Dennis Eilhoff
SV Darmstadt 98	Christian Mathenia
Bournemouth	Andrew Surman
Falkirk	Darren Barr
KAS Eupen	Ervin Zukanovic
Karlsruher SC	Sebastian Freis
RC Recreativo	Asier Riesgo
FC Energie Cottbus	Gerhard Tremmel
FC Ingolstadt 04	Marvin Matip
FC St. Pauli	Matthias Lehmann
SV Darmstadt 98	Luca Caldirola
Watford	Heurelho Gomes
Birmingham City	Roger Johnson
SC Paderborn 07	Lukas Kruse
Angers SCO	Romain Thomas
Cardiff City	Steven Caulker
Feirense	Fernando Varela

```
|    Uniao da Madeira   |     Diego Galo     |
|   Fortuna Düsseldorf  |   Fabian Giefer    |
|        Reading        |    Jobi McAnuff    |
|       Dijon FCO       |  Baptiste Reynet   |
|      Bournemouth      |   Simon Francis    |
+-----------------------+--------------------+
```

3. What is the match with the highest number of goals? Output `team_long_name` for both home and away teams, and the total number of goals for each team.

[21]:
```
%%sql psql
SELECT
  c.team_long_name AS away_team,
  away_team_goal,
  d.team_long_name AS home_team,
  home_team_goal,
  total_goals
FROM
  (
    SELECT
      id,
      away_team_api_id,
      home_team_api_id,
      home_team_goal,
      away_team_goal,
      (home_team_goal + away_team_goal) AS total_goals
    FROM
      MATCH
  ) a
  INNER JOIN (
    SELECT
      MAX(home_team_goal + away_team_goal) AS most_goals_match
    FROM
      MATCH
  ) b ON total_goals = most_goals_match
  LEFT JOIN team c ON c.team_api_id = a.away_team_api_id
  LEFT JOIN team d ON d.team_api_id = a.home_team_api_id;
```

[21]:
```
+----------------+----------------+---------------+----------------+-----------
--+
|   away_team    | away_team_goal |   home_team   | home_team_goal |
total_goals |
+----------------+----------------+---------------+----------------+-----------
--+
|   Hibernian    |       6        |   Motherwell  |       6        |      12
|
| Rayo Vallecano |       2        | Real Madrid CF |       10       |      12
|
```

```
+----------------+----------------+----------------+----------------+-----------
--+
```