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# FCP PART 2 PROJECT

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Group 21(G21)



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## 1. Introduction

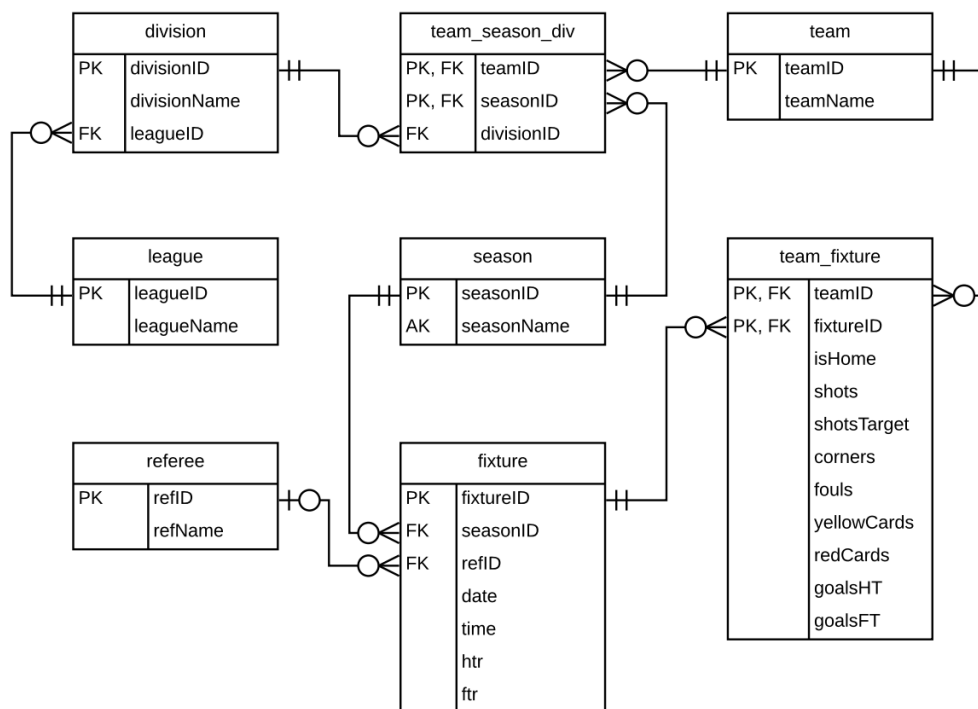
From the given notes as per the FCP2 project document, the below notes are included as guide in creating the tables and to generate the tables as per the created table.

- Matches are often termed "fixtures" in european football.
- Assume times in the dataset are GMT (i.e., you don't need to account for times being in different time zones depending on where the game is played).
- In the dataset on the course MySQL server, date is formatted as yyyy-mm-dd (unlike the CSV dataset files).
- isHome in the team\_fixture entity specifies whether the teamID in that fixture is the home team. If not, then it can be assumed they are the away team for that fixture.
- teamID, fixtureID, refID, leagueID, and seasonID are SKs and should be designed into your database accordingly, whereas divisionID uses data provided in the dataset.
- I am making an assumption that seasons across leagues and divisions are the same (e.g., 2022/2023). In reality, seasons may have different start and end dates, etc., in which case some changes would occur in the model.

## 2. Logical ER diagram

The given logical ER diagram as seen below, the diagram shows only the entities and their cardinality and relationship which helps us to write and create the table code and data table generation.

### ISQS 6338 (D20 & D21) FCP 2023 - European Football Model



### **3. Project completion MySQL code:**

The written MySQL code consists of create data tables, temporary table creation and data generation code with all functionalities in joining of tables, inserting values without hardcoding and update function accordingly. And in each of the data table output was exported to this document from the MySQL database using the export function.

As this formal submission document, moreover, we will attach the FCP2\_G21.sql file in our submission for you to rerun for your evaluation.

```
----- CLEAR EXISTING DATA -----

DROP TABLE IF EXISTS `team_fixture`;
DROP TABLE IF EXISTS `fixture`;
DROP TABLE IF EXISTS `team_season_division`;
DROP TABLE IF EXISTS `division`;
DROP TABLE IF EXISTS `league`;
DROP TABLE IF EXISTS `League`;
DROP TABLE IF EXISTS `team`;
DROP TABLE IF EXISTS `season`;
DROP TABLE IF EXISTS `referee`;

----- CREATE TABLES -----

CREATE TABLE G21.season (
  seasonID INT PRIMARY KEY AUTO_INCREMENT,
  seasonName VARCHAR(255)
);

CREATE TABLE G21.team (
  teamID INT PRIMARY KEY AUTO_INCREMENT,
  teamName VARCHAR(100)
);

CREATE TABLE G21.league (
  leagueID INT PRIMARY KEY AUTO_INCREMENT,
  leagueName VARCHAR(255)
);

CREATE TABLE G21.division (
  divisionID INT PRIMARY KEY AUTO_INCREMENT,
  divisionName VARCHAR(255),
  leagueID INT,
  FOREIGN KEY (leagueID) REFERENCES G21.league(leagueID)
);

CREATE TABLE G21.referee (
  refID INT PRIMARY KEY AUTO_INCREMENT,
  Name VARCHAR(50)
);
```

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```
CREATE TABLE G21.fixture (
  fixtureID INT PRIMARY KEY AUTO_INCREMENT,
  seasonID INT,
  refID INT,
  Date DATE,
  Time TIME,
  htr CHAR(1),
  ftr CHAR(1),
  FOREIGN KEY (refID) REFERENCES G21.referee(refID),
  FOREIGN KEY (seasonID) REFERENCES G21.season(seasonID)
);

CREATE TABLE G21.team_fixture (
  teamId INT,
  fixtureId INT,
  isHome bool,
  shots SMALLINT,
  shotsTarget SMALLINT,
  corners SMALLINT,
  fouls SMALLINT,
  yellowCards SMALLINT,
  redCards SMALLINT,
  goalsHT SMALLINT,
  goalsFT SMALLINT,
  PRIMARY KEY (teamId, fixtureId),
  FOREIGN KEY (teamId) REFERENCES G21.team(teamID),
  FOREIGN KEY (fixtureId) REFERENCES G21.fixture(fixtureID)
);

CREATE TABLE G21.team_season_division (
  teamID INT,
  seasonID INT,
  divisionID INT,
  PRIMARY KEY (teamID, seasonID),
  FOREIGN KEY (seasonID) REFERENCES G21.season(seasonID),
  FOREIGN KEY (divisionID) REFERENCES G21.division(divisionID),
  FOREIGN KEY (teamID) REFERENCES G21.team(teamID)
);

----- INSERT DATA -----

INSERT INTO G21.league (leagueName)
  SELECT DISTINCT league AS leagueName
  FROM fcp_2023.results_csv;

INSERT INTO G21.division (divisionName, leagueID)
  SELECT DISTINCT `div` AS divisionID, l.leagueId
  FROM fcp_2023.results_csv r
  JOIN G21.league l on r.league = l.leagueName;

INSERT INTO G21.season (seasonName)
  SELECT DISTINCT season AS seasonName
```

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```

FROM fcp_2023.results_csv;

INSERT INTO G21.team(teamName)
SELECT DISTINCT homeTeam
FROM fcp_2023.results_csv
UNION
SELECT DISTINCT awayTeam
FROM fcp_2023.results_csv;

INSERT INTO G21.referee(Name)
SELECT DISTINCT referee
FROM fcp_2023.results_csv results
where TRIM(referee) <> '';

INSERT INTO G21.fixture (seasonID,refID,Date,Time,htr,ftr)
SELECT
    seasonId,
    refId,
    date,
    time,
    htr,
    ftr
FROM fcp_2023.results_csv results
JOIN G21.season s on results.season = s.seasonName
LEFT JOIN G21.referee refs on results.referee = refs.Name;

INSERT INTO
G21.team_fixture(teamId,fixtureId,isHome,shots,shotsTarget,goalsHT,goalsFT,
yellowCards,redCards,goalsHT,goalsFT)
SELECT
    t.teamId,
    fixtureID,
    1 isHome,
    hs shots,
    hst shotsTarget,
    hc corners,
    hf fouls,
    hy yellowCards,
    hr redCards,
    hthg goalsHT,
    fthg goalsFT
FROM fcp_2023.results_csv r
join G21.team t on t.teamName = r.homeTeam
join G21.fixture f on f.date = r.date and f.time = r.time and f.ftr =
r.ftr and f.htr = r.htr;

INSERT INTO
G21.team_fixture(teamId,fixtureId,isHome,shots,shotsTarget,goalsHT,goalsFT,
yellowCards,redCards,goalsHT,goalsFT)
SELECT
    t.teamId,
    fixtureID,
    0 isHome,
    `as` shots,

```

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```
        ast shotsTarget,
        ac corners,
        af fouls,
        ay yellowCards,
        ar redCards,
        htag goalsHT,
        ftag goalsFT
FROM fcp_2023.results_csv r
join G21.team t on t.teamName = r.awayTeam
join G21.fixture f on f.date = r.date and f.time = r.time and f.ftr =
r.ftr and f.htr = r.htr;
```

```
INSERT INTO G21.team_season_division (teamId, seasonId, divisionID)
SELECT DISTINCT teamId, seasonId, divisionID
FROM fcp_2023.results_csv r
JOIN G21.team t on t.teamName = r.homeTeam
JOIN G21.season s on s.seasonName = r.season
JOIN G21.division d on d.divisionName = r.`div`
UNION
SELECT DISTINCT teamId, seasonId, divisionID
FROM fcp_2023.results_csv r
JOIN G21.team t on t.teamName = r.awayTeam
JOIN G21.season s on s.seasonName = r.season
JOIN G21.division d on d.divisionName = r.`div`;
```

----- CHECK DATA MATCHES ORIGINAL SOURCE -----

```
SELECT
    l.leagueName league,
    s.seasonName season,
    d.divisionName `div`,
    m.date,
    m.time,
    homeTeamName.teamName homeTeam,
    awayTeamName.teamName awayTeam,
    homeTeam.goalsFT fthg,
    awayTeam.goalsFT ftag,
    m.ftr,
    homeTeam.goalsHT hthg,
    awayTeam.goalsHT htag,
    m.htr,
    r.name referee,
    homeTeam.shots hs,
    awayTeam.shots `as`,
    homeTeam.shotsTarget hst,
    awayTeam.shotsTarget ast,
    homeTeam.fouls hf,
    awayTeam.fouls af,
    homeTeam.corners hc,
    awayTeam.corners ac,
    homeTeam.yellowCards hy,
    awayTeam.yellowCards ay,
    homeTeam.redCards hr,
    awayTeam.redCards ar
```

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```
FROM fixture m
  JOIN season s on m.seasonID = s.seasonId
  JOIN team_fixture homeTeam on m.fixtureID = homeTeam.fixtureID and
homeTeam.isHome = 1
  JOIN team homeTeamName on homeTeamName.teamId = homeTeam.teamId
  JOIN team_season_division tsd on tsd.seasonId = m.seasonId and
homeTeam.teamId = tsd.teamId
  JOIN division d on tsd.divisionId = d.divisionID
  JOIN league l on l.leagueID = d.leagueId
  JOIN team_fixture awayTeam on m.fixtureID = awayTeam.fixtureID and
awayTeam.isHome = 0
  JOIN team awayTeamName on awayTeamName.teamId = awayTeam.teamId
  LEFT JOIN referee r on m.refID = r.refID
```

### 4. Generated data tables

#### 4.1.Team data table

teamID	teamName
1	Werder Bremen
2	Ein Frankfurt
3	Wolfsburg
4	Bochum
5	Hertha
6	Mainz
7	Dortmund
8	Greuther Furth
9	M'gladbach
10	Hoffenheim
11	Augsburg
12	Union Berlin
13	Bayern Munich
14	Stuttgart
15	Schalke 04
16	Regensburg
17	Magdeburg
18	Darmstadt
19	Holstein Kiel
20	St Pauli
21	Erzgebirge Aue
22	Ingolstadt
23	Hansa Rostock

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24	Hannover
25	Nurnberg
26	Wurzbürger Kickers
27	Paderborn
28	Nott'm Forest
29	Aston Villa
30	Liverpool
31	Chelsea
32	Arsenal
33	Fulham
34	Man City
35	Brighton
36	Crystal Palace
37	Brentford
38	Wolves
39	Sheffield United
40	West Brom
41	Man United
42	Burnley
43	Reading
44	Hull
45	Swansea
46	Sunderland
47	Norwich
48	Millwall
49	Cardiff
50	Preston
51	Barnsley
52	Peterboro
53	Bristol City
54	Middlesbrough
55	Blackburn
56	Birmingham
57	Watford
58	Real Madrid
59	Villarreal
60	Barcelona
61	Valencia
62	Espanol
63	Girona



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64	Granada
65	Sociedad
66	Alaves
67	Ath Madrid
68	Osasuna
69	Betis
70	Malaga
71	Oviedo
72	Sp Gijon
73	Eibar
74	Andorra
75	Ponferradina
76	Almeria
77	Burgos
78	Zaragoza
79	Leganes
80	Vallecano
81	Tenerife
82	RB Leipzig
83	FC Koln
84	Bielefeld
85	Leverkusen
86	Kaiserslautern
87	Heidenheim
88	Hamburg
89	Fortuna Dusseldorf
90	Tottenham
91	Bournemouth
92	Rotherham
93	Stoke
94	Huddersfield
95	Coventry
96	Mallorca
97	Sevilla
98	Valladolid
99	Ath Bilbao
100	Elche
101	Santander
102	Lugo
103	Levante

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104	Huesca
105	Cartagena
106	Castellon

### 4.2.Leagues data table

leagueID	leagueName
1	German
2	English
3	Spanish

### 4.3.Division data table

divisionID	divisionName	leagueID
1	D1	1
2	D2	1
3	E0	2
4	E1	2
5	SP1	3
6	SP2	3

### 4.4.Season data table

seasonID	seasonName
1	2022/2023
2	2021/2022
3	2020/2021

### 4.5.team\_season\_div data table

teamID	seasonID	divisionID
1	1	1
2	1	1
3	1	1
3	2	1
3	3	1
4	1	1
5	1	1
5	2	1
6	1	1

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6	2	1
7	1	1
8	2	1
9	2	1
9	3	1
10	1	1
10	2	1
10	3	1
11	2	1
11	3	1
12	1	1
12	2	1
13	1	1
13	2	1
13	3	1
14	3	1
15	1	1
15	3	1
82	1	1
82	3	1
83	1	1
84	2	1
85	2	1
1	2	2
4	3	2
8	1	2
8	3	2
15	2	2
16	1	2
17	1	2
18	1	2
18	2	2
18	3	2
19	1	2
19	2	2
20	2	2
21	2	2
21	3	2
22	2	2
23	2	2

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24	3	2
25	3	2
26	3	2
27	3	2
84	1	2
86	1	2
87	1	2
87	3	2
88	1	2
88	2	2
89	2	2
28	1	3
29	1	3
29	2	3
29	3	3
30	1	3
30	2	3
30	3	3
31	1	3
31	2	3
31	3	3
32	1	3
32	2	3
33	1	3
33	3	3
34	2	3
34	3	3
35	2	3
35	3	3
36	2	3
37	2	3
38	2	3
38	3	3
39	3	3
40	3	3
41	2	3
41	3	3
42	3	3
47	2	3
57	2	3

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90	1	3
91	1	3
28	2	4
28	3	4
33	2	4
37	3	4
40	1	4
40	2	4
42	1	4
43	1	4
43	3	4
44	1	4
44	2	4
45	1	4
45	3	4
46	1	4
47	1	4
47	3	4
48	1	4
48	3	4
49	1	4
49	2	4
49	3	4
50	1	4
50	2	4
51	2	4
51	3	4
52	2	4
53	2	4
53	3	4
54	3	4
55	1	4
55	2	4
55	3	4
56	3	4
57	1	4
57	3	4
91	3	4
92	1	4
93	2	4

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94	3	4
95	3	4
58	1	5
59	1	5
59	2	5
60	1	5
60	2	5
61	1	5
62	1	5
62	2	5
63	1	5
64	2	5
64	3	5
65	2	5
65	3	5
66	2	5
67	2	5
67	3	5
68	2	5
68	3	5
69	1	5
69	2	5
69	3	5
80	1	5
96	1	5
97	1	5
97	2	5
98	1	5
99	2	5
99	3	5
100	3	5
62	3	6
63	2	6
63	3	6
64	1	6
66	1	6
70	1	6
70	3	6
71	1	6
71	3	6

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72	1	6
73	1	6
73	2	6
74	1	6
75	1	6
75	2	6
75	3	6
76	2	6
76	3	6
77	2	6
78	2	6
79	1	6
79	2	6
80	3	6
81	3	6
96	3	6
98	2	6
101	1	6
102	1	6
102	3	6
103	1	6
104	1	6
105	2	6
106	3	6

### 4.6. Referee data table

refID	Name
1	P Bankes
2	P Tierney
3	M Oliver
4	A Taylor
5	G Scott
6	J Moss
7	K Friend
8	C Pawson
9	R Jones
10	C Kavanagh
11	M Atkinson
12	A Marriner

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13	D Webb
14	D Bond
15	J Gillett
16	T Robinson
17	J Linington
18	M Donohue
19	J Busby
20	A Davies
21	D Whitestone
22	J Simpson
23	G Eltringham
24	S Hooper
25	J Brooks

### 4.7.Fixture data table

fixtureID	seasonID	refID	Date	Time	htr	ftr
1	1	NULL	2023-01-25	19:30:00	D	A
2	1	NULL	2023-03-31	19:30:00	D	D
3	1	NULL	2023-02-18	14:30:00	A	A
4	1	NULL	2023-04-22	14:30:00	A	A
5	1	NULL	2022-08-21	16:30:00	A	A
6	1	NULL	2022-11-12	14:30:00	H	H
7	1	NULL	2023-03-04	14:30:00	H	H
8	1	NULL	2022-09-17	14:30:00	D	H
9	2	NULL	2021-08-21	14:30:00	A	D
10	2	NULL	2022-01-15	17:30:00	D	A
11	2	NULL	2022-04-17	16:30:00	D	D
12	2	NULL	2022-04-06	17:30:00	H	H
13	2	NULL	2021-11-20	17:30:00	H	H
14	2	NULL	2022-05-14	14:30:00	A	D



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15	3	NULL	2021-04-03	14:30:00	H	H
16	3	NULL	2020-10-04	14:30:00	D	D
17	3	NULL	2021-05-08	17:30:00	H	H
18	3	NULL	2021-04-21	19:30:00	A	H
19	3	NULL	2021-04-21	19:30:00	A	A
20	3	NULL	2021-02-06	14:30:00	A	A
21	1	NULL	2023-04-23	12:30:00	D	D
22	1	NULL	2022-08-07	12:30:00	D	A
23	1	NULL	2022-08-27	12:00:00	H	D
24	1	NULL	2023-04-29	12:00:00	D	H
25	1	NULL	2023-03-12	12:30:00	D	A
26	1	NULL	2022-10-28	17:30:00	H	H
27	2	NULL	2021-08-13	17:30:00	D	H
28	2	NULL	2022-02-11	17:30:00	A	A
29	2	NULL	2021-12-03	17:30:00	H	H
30	2	NULL	2021-09-25	12:30:00	D	A
31	2	NULL	2021-09-21	12:30:00	H	H
32	2	NULL	2021-11-07	12:30:00	A	A
33	3	NULL	2021-01-29	17:30:00	H	H
34	3	NULL	2021-04-18	12:30:00	H	H
35	3	NULL	2021-02-12	17:30:00	D	D
36	3	NULL	2021-04-24	12:00:00	H	H
37	3	NULL	2021-04-11	12:30:00	A	D
38	3	NULL	2021-03-05	17:30:00	D	A
39	1	1	2023-01-01	16:30:00	A	D
40	1	2	2022-12-26	17:30:00	A	A

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41	1	3	2023-01-21	12:30:00	D	D
42	1	3	2022-11-06	12:00:00	D	A
43	1	4	2022-10-01	12:30:00	D	H
44	1	5	2022-10-15	15:00:00	A	D
45	2	3	2022-05-22	16:00:00	A	H
46	2	4	2021-08-21	17:30:00	H	H
47	2	6	2021-08-14	15:00:00	H	H
48	2	3	2022-03-06	16:30:00	H	H
49	2	7	2022-01-23	14:00:00	A	A
50	2	3	2021-09-11	15:00:00	D	H
51	2	1	2022-01-22	15:00:00	D	A
52	3	8	2021-03-15	20:00:00	A	A
53	3	9	2021-03-03	18:00:00	H	H
54	3	10	2021-01-26	20:15:00	A	A
55	3	1	2021-01-27	20:15:00	A	A
56	3	11	2021-02-03	18:00:00	A	A
57	3	8	2020-09-14	20:15:00	A	A
58	3	12	2020-10-18	12:00:00	D	D
59	3	2	2021-01-17	16:30:00	D	D
60	1	13	2022-11-04	20:00:00	D	A
61	1	13	2023-04-01	15:00:00	D	D
62	1	14	2022-10-23	12:00:00	H	H
63	1	13	2023-02-15	20:00:00	D	D
64	1	15	2023-01-20	20:00:00	A	H
65	1	16	2022-10-22	15:00:00	H	A
66	1	17	2023-02-25	15:00:00	H	H

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67	1	13	2022-10-19	20:00:00	H	H
68	2	18	2022-01-15	12:30:00	A	A
69	2	19	2021-12-18	15:00:00	A	H
70	2	20	2021-09-18	15:00:00	D	D
71	2	16	2022-01-15	15:00:00	H	H
72	2	16	2022-03-12	12:30:00	H	D
73	2	21	2022-03-12	15:00:00	D	D
74	3	17	2021-02-20	15:00:00	D	A
75	3	22	2021-02-16	19:45:00	H	H
76	3	23	2021-03-12	19:45:00	A	A
77	3	16	2020-12-19	12:30:00	H	H
78	3	23	2021-01-30	15:00:00	D	D
79	3	24	2020-10-21	19:45:00	A	D
80	3	6	2021-03-06	12:30:00	H	H
81	3	25	2021-04-25	12:00:00	H	D
82	3	21	2021-04-24	15:00:00	H	H
83	1	NULL	2022-09-11	13:00:00	D	H
84	1	NULL	2023-03-12	17:30:00	A	D
85	1	NULL	2023-03-19	20:00:00	D	H
86	1	NULL	2023-05-28	18:00:00	D	D
87	1	NULL	2022-09-10	15:15:00	A	A
88	1	NULL	2023-04-24	18:30:00	A	H
89	1	NULL	2022-12-29	16:00:00	D	D
90	2	NULL	2022-01-23	13:00:00	D	A
91	2	NULL	2022-02-13	17:30:00	H	H
92	2	NULL	2021-10-03	17:30:00	H	H

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93	2	NULL	2021-09-18	20:00:00	A	A
94	2	NULL	2022-04-02	20:00:00	H	H
95	2	NULL	2022-02-20	13:00:00	A	D
96	2	NULL	2022-02-27	20:00:00	H	H
97	2	NULL	2021-11-27	20:00:00	D	A
98	3	NULL	2021-01-24	13:00:00	H	H
99	3	NULL	2021-02-01	20:00:00	D	H
100	3	NULL	2020-09-27	15:00:00	H	H
101	3	NULL	2021-04-21	19:00:00	D	D
102	3	NULL	2021-05-07	20:00:00	D	H
103	3	NULL	2020-11-08	15:15:00	H	H
104	1	NULL	2023-03-05	17:30:00	D	A
105	1	NULL	2022-08-21	16:30:00	D	H
106	1	NULL	2023-05-28	15:15:00	A	A
107	1	NULL	2022-11-20	18:00:00	D	D
108	1	NULL	2023-03-11	17:30:00	D	D
109	1	NULL	2023-05-20	17:30:00	D	H
110	1	NULL	2022-11-03	20:00:00	D	D
111	1	NULL	2023-04-16	13:00:00	H	H
112	2	NULL	2022-05-01	17:15:00	H	H
113	2	NULL	2022-03-27	20:00:00	A	A
114	2	NULL	2022-04-30	19:30:00	A	A
115	2	NULL	2021-11-22	20:00:00	A	A
116	2	NULL	2022-05-14	20:00:00	A	A
117	2	NULL	2021-10-17	15:00:00	A	A
118	3	NULL	2021-05-30	20:00:00	A	A

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119	3	NULL	2021-05-30	20:00:00	D	D
120	3	NULL	2021-02-21	17:15:00	H	H
121	3	NULL	2021-02-13	19:30:00	D	H
122	3	NULL	2020-09-27	17:15:00	H	H
123	3	NULL	2021-05-19	20:30:00	A	A
124	3	NULL	2020-09-27	17:15:00	D	A
125	3	NULL	2020-12-13	15:00:00	D	H
126	3	NULL	2020-12-21	20:30:00	H	H

### 4.8.team\_fixture data table

teamId	fixtureId	isHome	shots	shotsTarget	corners	fouls	yellowCards	redCards	goalsHT	goalsFT
1	1	1	8	3	5	11	0	0	1	1
1	29	1	15	8	6	14	2	0	2	4
2	2	1	18	7	15	14	3	0	1	1
3	3	1	7	2	2	16	1	0	0	0
3	4	0	15	7	3	8	3	0	3	5
3	14	1	10	2	2	5	1	0	1	2
3	16	1	17	6	12	7	0	0	0	0
3	19	0	13	4	1	11	0	0	2	3
4	2	0	8	2	2	13	2	0	1	1
4	4	1	23	6	10	11	3	0	0	1
4	5	1	13	7	5	10	1	0	0	0
4	34	1	11	7	8	16	1	0	2	4
5	6	1	17	8	10	15	3	0	1	2
5	13	0	6	3	6	13	1	0	0	0
6	7	1	16	6	11	12	1	0	1	1
6	12	0	17	3	7	18	2	0	0	1
7	8	1	19	7	11	12	3	0	0	1
8	9	1	20	5	5	12	4	0	0	1
8	11	0	7	1	1	15	3	0	0	0
8	26	1	17	7	6	12	2	0	1	1
8	33	1	12	6	2	13	3	0	2	3
9	10	1	16	6	5	8	2	0	0	1
9	17	0	14	2	3	9	2	0	0	0
9	18	0	5	3	4	5	0	0	2	2

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10	7	0	15	4	3	15	4	0	0	0
10	11	1	16	3	10	19	3	0	0	0
10	15	0	16	6	10	11	1	0	0	1
10	18	1	19	6	5	9	3	0	0	3
11	12	1	14	4	5	16	3	0	1	2
11	15	1	7	2	2	7	1	0	2	2
11	16	0	9	1	2	13	1	0	0	0
12	1	0	11	5	7	17	0	0	1	2
12	13	1	16	5	7	17	1	0	2	2
13	5	0	22	12	5	6	0	0	4	7
13	14	0	25	10	12	10	2	0	2	2
13	17	1	22	7	5	3	0	1	4	6
14	19	1	11	4	4	12	3	0	0	1
15	8	0	3	0	2	14	2	0	0	0
15	20	1	3	1	1	14	2	0	0	0
15	32	1	19	8	9	7	2	0	1	2
16	21	1	10	4	4	11	0	1	0	0
16	25	0	8	4	0	10	4	0	1	2
17	22	1	9	3	3	10	4	1	1	1
17	24	1	11	4	2	11	2	0	1	3
18	23	1	16	6	12	8	2	0	1	2
18	31	0	12	5	4	16	4	0	0	1
18	32	0	17	6	4	21	2	0	2	4
18	38	0	18	8	4	18	5	0	1	3
19	22	0	17	6	9	15	4	0	1	2
19	25	1	15	3	9	8	2	0	1	1
19	28	0	12	4	3	11	3	0	2	3
20	27	1	15	4	3	9	2	0	1	3
21	28	1	12	5	5	14	4	1	0	2
21	29	0	9	3	2	16	2	0	0	0
21	33	0	7	2	4	16	2	0	0	0
22	30	1	11	3	4	15	4	0	0	1
23	31	1	13	5	7	11	2	0	1	2
24	34	0	14	8	9	16	1	0	1	3
24	35	1	11	2	6	13	2	0	0	0
25	36	1	17	7	3	8	0	0	2	3
25	37	0	13	6	6	21	4	0	1	1
26	37	1	14	4	3	8	3	0	0	1
27	35	0	11	3	5	11	0	0	0	0
27	38	1	17	2	7	10	3	0	1	2

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28	39	1	12	5	1	16	2	0	0	1
28	69	1	9	3	5	7	2	0	0	2
28	80	0	9	0	8	8	1	0	0	0
29	40	1	12	6	0	7	0	0	0	1
29	45	0	4	2	1	11	1	0	1	2
29	53	0	16	4	7	6	0	0	0	0
30	40	0	16	9	6	12	0	0	2	3
30	41	1	15	3	5	16	3	0	0	0
30	49	0	15	7	5	10	1	0	2	3
30	52	0	12	4	2	10	1	0	1	1
30	59	1	17	3	7	15	2	0	0	0
31	39	0	7	2	2	14	2	0	1	1
31	41	0	11	2	5	9	1	0	0	0
31	42	1	5	1	4	20	5	0	0	0
31	47	1	13	6	5	15	0	0	2	3
31	57	0	10	5	3	13	0	0	1	3
32	42	0	14	2	6	13	2	0	0	1
32	43	1	22	9	5	10	2	0	1	3
32	50	1	30	7	8	9	1	0	0	1
33	44	1	19	4	5	9	2	0	1	2
33	58	0	15	6	5	9	2	0	0	1
33	71	1	18	8	6	8	0	0	5	6
33	72	0	16	3	5	13	3	0	0	1
34	45	1	24	5	13	5	0	0	0	3
34	48	1	24	10	9	10	0	0	2	4
34	54	0	18	7	8	8	0	0	4	5
34	56	0	17	6	3	5	1	0	2	2
35	46	1	13	3	7	11	4	0	2	2
35	57	1	13	3	4	8	1	0	0	1
36	47	0	4	1	2	11	0	0	0	0
36	49	1	8	5	2	12	4	0	0	1
37	51	1	11	1	6	6	2	0	0	1
37	76	0	13	3	3	15	2	0	1	1
38	51	0	7	2	3	7	3	0	0	2
38	52	1	10	5	3	17	2	0	0	0
39	53	1	9	2	2	13	1	1	1	1
39	55	0	5	3	2	12	1	0	1	2
39	58	1	10	6	2	5	0	0	0	1
40	54	1	4	1	3	8	2	0	0	0
40	63	1	12	4	12	10	2	0	0	1

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40	64	0	8	2	5	8	1	0	1	1
40	70	0	12	3	10	12	1	0	1	1
41	48	0	5	2	3	14	1	0	1	1
41	55	1	16	4	7	10	1	0	0	1
41	59	0	8	4	3	6	1	0	0	0
42	56	1	2	0	1	8	2	0	0	0
42	64	1	17	2	16	7	1	0	0	2
42	65	0	9	4	5	10	3	0	0	4
43	60	1	11	2	3	10	1	0	0	1
43	81	1	14	4	7	13	1	0	1	2
44	61	1	14	1	8	7	0	0	0	0
44	69	0	11	2	5	12	5	0	1	1
45	62	1	13	6	7	5	3	0	1	2
45	81	0	15	4	4	15	2	0	0	2
46	65	1	10	5	2	9	1	0	2	2
47	50	0	10	1	4	11	2	0	0	0
47	66	1	13	4	3	12	1	0	2	2
47	77	1	16	5	6	14	0	0	1	2
48	67	1	12	4	2	12	0	0	3	3
48	82	0	10	2	5	19	1	0	0	0
49	62	0	3	1	1	10	3	1	0	0
49	66	0	9	2	5	9	1	0	0	0
49	68	1	11	2	7	10	4	0	0	0
49	77	0	10	3	7	16	4	0	0	0
49	79	1	13	3	6	18	2	0	0	1
50	60	0	10	4	2	9	4	0	0	2
50	70	1	8	2	3	10	1	0	1	1
51	72	1	8	3	4	15	4	0	1	1
51	74	0	15	5	5	14	2	0	0	1
52	73	1	6	3	3	18	1	0	1	2
53	71	0	8	5	4	8	2	0	2	2
53	74	1	1	1	0	8	1	0	0	0
54	75	1	11	5	9	14	1	1	2	2
55	63	0	10	4	5	12	1	0	0	1
55	68	0	4	2	2	13	5	1	1	1
55	76	1	10	4	2	19	4	0	0	0
56	78	1	13	3	9	19	3	0	1	1
57	46	0	10	1	2	6	0	0	0	0
57	67	0	13	2	5	10	2	0	0	0
57	80	1	12	4	7	16	2	0	1	1



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57	82	1	13	4	5	9	0	0	1	1
58	83	1	22	7	4	7	3	0	1	4
58	85	0	11	3	1	13	3	0	1	1
59	84	1	15	4	2	8	3	0	0	1
59	92	1	11	5	4	14	2	0	1	2
59	97	1	14	2	4	19	2	0	0	1
60	85	1	17	7	8	12	4	0	1	2
60	96	1	17	7	5	8	2	0	1	4
60	97	0	12	6	4	14	2	0	0	3
61	86	1	19	4	10	12	0	0	1	2
61	88	1	18	5	6	16	0	0	0	2
62	86	0	9	5	3	12	4	0	1	2
62	87	1	19	5	9	11	3	0	1	2
62	95	1	11	4	3	14	4	0	0	1
62	124	0	5	2	4	12	0	0	0	2
63	89	1	16	7	2	14	3	0	1	2
63	113	0	9	6	2	11	6	1	1	1
63	120	1	5	2	3	15	3	0	2	2
63	126	0	9	2	6	13	2	1	0	0
64	90	1	6	2	4	12	0	0	0	0
64	91	0	15	2	5	13	2	0	0	0
64	98	0	12	1	5	15	4	0	0	1
64	100	0	11	6	1	14	1	0	0	1
64	103	0	2	1	0	11	1	0	0	0
64	110	1	16	3	8	14	1	0	0	0
65	91	1	18	8	6	13	0	0	1	2
65	102	1	16	3	7	8	1	0	0	2
65	103	1	22	9	15	8	2	1	2	2
66	93	1	8	3	2	11	4	0	0	0
66	94	0	7	1	2	13	0	0	0	1
66	107	0	7	0	4	11	1	0	0	0
66	108	1	18	6	6	13	3	0	0	0
66	109	1	15	4	6	23	3	0	0	2
67	94	1	14	8	8	10	1	0	1	4
67	100	1	17	10	1	16	3	0	1	6
68	90	0	16	7	3	15	2	0	0	2
68	93	0	13	5	8	14	3	0	2	2
68	98	1	7	4	1	15	5	1	2	3
68	99	0	15	5	4	6	1	0	0	0
69	84	0	6	3	4	11	2	0	1	1

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69	92	0	10	3	6	9	4	0	0	0
69	99	1	8	4	3	12	1	0	0	1
69	101	1	6	2	5	10	3	1	0	0
70	104	1	20	3	5	14	1	1	0	0
70	109	0	15	5	3	15	3	0	0	1
70	125	0	10	5	5	13	2	0	1	1
71	105	1	11	5	4	16	5	0	0	1
71	124	1	7	2	7	17	2	0	0	0
72	106	1	20	4	4	12	1	0	0	1
73	107	1	11	0	4	10	0	0	0	0
73	116	0	10	3	1	14	4	0	2	3
74	111	1	12	8	3	5	1	0	1	1
75	106	0	6	5	1	12	1	0	1	4
75	112	1	14	5	2	9	4	0	3	4
75	119	1	13	5	3	6	0	0	1	2
75	121	0	7	4	2	22	0	0	0	0
75	122	1	7	4	2	23	1	0	3	3
76	113	1	15	4	5	13	2	0	0	0
76	114	0	13	5	4	17	2	0	2	2
76	125	1	9	6	3	18	7	0	1	3
77	114	1	13	7	3	7	2	0	0	0
78	115	1	13	3	1	18	3	0	0	0
79	105	0	5	0	2	10	3	1	0	0
79	115	0	10	4	3	15	3	0	1	2
79	116	1	19	5	7	13	3	0	1	2
79	117	1	12	4	3	17	3	0	0	0
80	89	0	12	4	4	14	2	0	1	2
80	118	1	23	6	12	10	1	0	0	0
80	122	0	10	3	8	14	3	0	0	0
81	121	1	18	7	4	14	1	0	0	1
81	123	1	11	3	2	23	5	0	0	0
81	126	1	9	5	4	20	2	1	2	2
82	3	0	17	5	5	15	1	0	1	3
82	20	0	24	10	7	16	1	0	1	3
83	6	0	10	2	5	10	1	0	0	0
84	9	0	9	2	0	15	2	1	1	1
84	26	0	9	1	3	13	2	0	0	0
85	10	0	29	13	7	18	3	0	0	2
86	21	0	9	2	3	13	4	0	0	0
87	23	0	8	4	2	18	6	0	0	2

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87	36	0	10	4	4	15	5	1	1	1
88	24	0	13	7	12	17	3	0	1	2
88	27	0	9	2	3	12	3	0	1	2
89	30	0	13	2	8	13	3	1	0	2
90	43	0	7	3	2	10	1	1	1	1
91	44	0	10	6	6	11	0	0	2	2
91	79	0	17	6	6	15	0	0	1	1
92	61	0	4	0	8	14	2	1	0	0
93	73	0	14	2	3	10	2	0	1	2
94	75	0	16	5	4	17	1	0	1	1
95	78	0	13	3	0	11	1	0	1	1
96	83	0	5	2	3	15	5	0	1	1
96	119	0	14	5	7	8	3	0	1	2
96	123	0	10	5	7	9	2	0	1	1
97	87	0	11	7	3	14	5	1	3	3
97	95	0	7	2	7	14	5	1	1	1
98	88	0	8	2	2	17	4	0	1	1
98	117	0	12	4	2	12	1	0	1	2
99	96	0	6	3	0	10	1	0	0	0
99	101	0	16	4	4	16	2	0	0	0
100	102	0	1	0	0	10	3	1	0	0
101	104	0	14	7	6	14	4	0	0	1
102	108	0	9	3	5	16	3	1	0	0
102	118	0	8	5	1	8	2	0	1	1
103	110	0	4	1	1	12	6	0	0	0
104	111	0	6	2	3	17	5	1	0	0
105	112	0	15	6	3	14	2	0	2	2
106	120	0	11	3	6	17	1	0	0	1