Project Report
Database Management Systems Project File

Indian Institute of Information Technology, Bhopal

Department of Information Technology
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Database Management System (IT-224)

Bachelor of Technology
2nd Year, 4th Semester

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DBMS Project Report

Football League Information System (FLIS)

Frontend Part:

Link to code: https://github.com/nitingupta-max/dbms_project
Used Reactjs for making a simple UI which shows the output of some queries.
This contains a button for each table which shows all the information that is placed inside the table.

Football League Information System

| Teams | Players | Managers | Match | Match Referee | Referee |

Teams (Query : SELECT * FROM teams;)

Team ID	Name	City	Playground	Jersey_home_color	Jersey_away_color
T0001	Amigos	London	Emirates Stadium	Red	Blue
T0002	Thunder	leeds	Villa Park	White	Red
T0003	Rainbow	Moscow	City Park	Black	White
T0004	Black Eagles	New York	Griffin Prk	Orange	Black
T0005	All Stars	Pune	M S Maidan	Yellow	Pink
T0006	Arawali	Hyderabad	J K Park	Pink	Yellow

Football League Information System

| Teams | Players | Managers | Match | Match Referee | Referee |

Managers (Query : SELECT * FROM managers;)

Mgr ID	Name	DOB	Team ID	Since
M0001	Jacob	1990-08-22T18:30:00.000Z	T0001	2020-06-21T18:30:00.000Z
M0002	Scott	1985-05-01T18:30:00.000Z	T0002	2021-03-21T18:30:00.000Z
M0003	Brandon	1995-02-14T18:30:00.000Z	T0003	2019-04-01T18:30:00.000Z
M0004	Jack	1987-01-24T18:30:00.000Z	T0004	2018-03-10T18:30:00.000Z
M0005	Adom	1991-02-16T18:30:00.000Z	T0005	2020-02-14T18:30:00.000Z
M0006	Philip	1989-10-03T18:30:00.000Z	T0006	2021-05-15T18:30:00.000Z

Backend Part:

Link to code: https://github.com/nitingupta-max/dbms_backend
Created a REST API using NodeJs and ExpressJs which uses GET requests to retrieve data from the database.

Database Part:

Used Postgresql to create a relational database schema to manage the information of a football league for a given season. It consists of several teams, the teams' players, the managers who manage the teams, the match information, scores, and the match referees.

Conditions followed in the project:

- A player cannot play for more than one team.
- Each player is associated with player_id, name, date of birth and a jersey number, which is unique for a team.
- A manager cannot be associated with more than one team.
- Each manager has a manager id, name, date of birth, the year since she/he is managing the team
- A team has a team id, name, city, playground name, and two jersey colors - home jersey colour and away jersey colour.
- Each match is played between two teams - the host team and the guest team.
- The match is played on the host team's playground.
- There can be only one match per day (date).
- Each match is conducted by 4 referees. The role types of the referees are as follows:
    - Referee (main referee)
    - Assistant referee-1
    - Assistant referee-2
    - Fourth referee

Table descriptions:

teams table: (PK: team_id)
- team_id: ID of the football team, e.g., T0001, T0002
- name: name of the team name
- city: city of the team
- playground: name of the playground of the football team
- jersey_home_color: home jersey color
- jersey_away_color: away jersey color

players table: (PK: player_id)
- player_id: ID of the player, e.g., P1001, P2001
- name: player's name

- dob: date of birth of the players
- jersey_no: jersey no of the players
- team_id: team id of the players refers to teams

managers table: (PK: mgr_id)
- mgr_id: ID of the manger, e.g. M0001, M0002
- name: name of the manager
- dob: date of birth of the manager
- team_id: ID of the football team, e.g., T0001, T0002
- since: date since the manager associated with the team

matches table:(PK: match_num)
- match_num: match number, e.g. M0001, M0002
- match_date: match date
- host_team_id: host team id (matches played on host team's playground)
- guest_team_id: guest team id
- host_team_score: host team score
- guest_team_score: guest team score

referees table: (PK: referee_id)
- referee_id: referee_id, e.g. R0001, R0002
- name: name of the referees
- dob: date of birth of referees

match_referees table: (PK: match_num, referee_id)
- match_num: match number, e.g., M0001, M0002
- referee: the referee id for the main referee
- assistant_referee_1: the referee id for the first assistant referee
- assistant_referee_2: the referee id for the second assistant referee
- fourth_referee: the referee id for the fourth referee

SQL Queries Used:

Create Tables:

```
CREATE TABLE managers (
    mgr_id character varying(10) NOT NULL,
    name character varying(80) NOT NULL,
    dob date NOT NULL,
    team_id character varying(10),
    since date
);
CREATE TABLE match_referees (
    match_num character varying(10) NOT NULL,
    referee character varying(15),
    assistant_referee_1 character varying(15),
    assistant_referee_2 character varying(15),
    fourth_referee character varying(15)
);

CREATE TABLE matches (
    match_num character varying(10) NOT NULL,
    match_date date NOT NULL,
    host_team_id character varying(10) NOT NULL,
    guest_team_id character varying(10) NOT NULL,
    host_team_score integer NOT NULL,
    guest_team_score integer NOT NULL
);


CREATE TABLE  players (
    player_id character varying(10) NOT NULL,
    name character varying(80) NOT NULL,
    dob date NOT NULL,
    jersey_no integer NOT NULL,
    team_id character varying(10) NOT NULL
);

CREATE TABLE referees (
    referee_id character varying(10) NOT NULL,
    name character varying(80) NOT NULL,
```

```
    dob date NOT NULL
);

CREATE TABLE teams (
    team_id character varying(10) NOT NULL,
    name character varying(80) NOT NULL,
    city character varying(80) NOT NULL,
    playground character varying(80) NOT NULL,
    jersey_home_color character varying(80),
    jersey_away_color character varying(80)
);
```

Insert Values from stdin:

```
COPY managers (mgr_id, name, dob, team_id, since) FROM stdin;
M0001	Jacob	1990-08-23	T0001	2020-06-22
M0002	Scott	1985-05-02	T0002	2021-03-22
M0003	Brandon	1995-02-15	T0003	2019-04-02
M0004	Jack	1987-01-25	T0004	2018-03-11
M0005	Adom	1991-02-17	T0005	2020-02-15
M0006	Philip	1989-10-04	T0006	2021-05-16
\.

COPY match_referees (match_num, referee, assistant_referee_1, assistant_referee_2,
fourth_referee) FROM stdin;
M0001	R0001	R0002	R0003	R0004
M0002	R0005	R0006	R0007	R0001
M0003	R0002	R0003	R0004	R0005
M0004	R0006	R0007	R0001	R0002
M0005	R0003	R0004	R0005	R0006
M0006	R0007	R0001	R0003	R0002
M0007	R0004	R0005	R0006	R0007
M0008	R0001	R0002	R0003	R0004
M0009	R0005	R0006	R0007	R0001
M0010	R0002	R0005	R0003	R0004
M0011	R0006	R0007	R0001	R0002
M0012	R0005	R0006	R0003	R0004
M0013	R0001	R0002	R0003	R0007
M0014	R0001	R0002	R0003	R0004
```

```
M0016  R0001  R0002  R0003  R0007
M0015  R0001  R0002  R0003  R0004
\.

COPY matches (match_num, match_date, host_team_id, guest_team_id, host_team_score,
guest_team_score) FROM stdin;
M0001  2020-05-06    T0001  T0006  5      4
M0002  2020-05-07    T0002  T0005  0      1
M0003  2020-05-09    T0003  T0004  2      3
M0004  2020-05-10    T0004  T0003  1      2
M0005  2020-05-11    T0005  T0002  2      1
M0006  2020-05-15    T0006  T0001  5      0
M0007  2020-05-17    T0001  T0005  5      5
M0008  2020-05-19    T0002  T0006  0      0
M0009  2020-05-21    T0003  T0001  4      4
M0010  2020-05-20    T0004  T0002  1      1
M0011  2020-05-21    T0004  T0003  2      1
M0012  2020-05-22    T0003  T0004  1      2
M0013  2020-05-23    T0004  T0001  4      3
M0014  2020-05-24    T0004  T0002  1      2
M0015  2020-05-25    T0003  T0001  3      2
M0016  2020-05-26    T0001  T0002  1      2
\.


COPY players (player_id, name, dob, jersey_no, team_id) FROM stdin;
P1001  Rudra   2003-05-01    99     T0001
P1002  Advik   2004-06-01    89     T0001
P1003  Adi     2003-05-07    79     T0001
P1004  veer    2003-08-12    69     T0001
P1005  Ahmed   2003-09-13    59     T0001
P1006  Viyan   2002-10-14    49     T0001
P1007  Pramav        2003-11-15     39     T0001
P1008  Shlok   2005-12-16    29     T0001
P1009  Madhav        2004-01-17     19     T0001
P1011  Adam    2003-03-19    1      T0001
P1012  Aarush  2003-04-20    20     T0001
P2001  Kiaan   2003-12-30    1      T0002
P2002  Rudrash       2004-11-29     2      T0002
P2003  Tanish  2002-10-28    3      T0002
```

P2004	Anand	2001-09-27	4	T0002
P2005	Bhaskar	2005-08-24	5	T0002
P2006	Arup	2003-07-23	6	T0002
P2007	Srihan	2003-06-20	7	T0002
P2008	Advit	2003-05-15	10	T0002
P2009	Raghav	2003-04-12	11	T0002
P2010	Krishna	2003-03-09	12	T0002
P2011	Manas	2004-02-08	13	T0002
P2012	Zayan	2003-01-01	14	T0002
P3001	Daksh	2003-12-30	10	T0003
P3002	Aditya	2004-11-29	26	T0003
P3003	Jay	2004-10-28	34	T0003
P3004	Ravi	2001-09-27	39	T0003
P3005	Suman	2004-08-24	40	T0003
P3006	Souvik	2003-07-22	51	T0003
P3007	Tanmoy	2005-06-20	56	T0003
P3008	Arijit	2003-05-15	74	T0003
P3009	Shivansh	2003-04-22	84	T0003
P3010	Elvin	2005-03-09	93	T0003
P3011	Kabir	2003-02-08	16	T0003
P3012	Joseph	2002-01-01	15	T0003
P4001	William	2003-12-30	10	T0004
P4002	James	2004-11-29	31	T0004
P4003	Issac	2004-10-28	44	T0004
P4004	Max	2001-09-22	55	T0004
P4005	Teddy	2004-08-24	65	T0004
P4006	Finley	2003-06-22	71	T0004
P4007	Jack	2005-06-20	66	T0004
P4008	henry	2003-05-15	44	T0004
P4009	Harry	2003-04-22	88	T0004
P4010	Charlie	2005-03-09	93	T0004
P4011	George	2003-02-08	17	T0004
P4012	Alexander	2002-01-01	29	T0004
P5001	Mark	2002-05-22	15	T0005
P5002	Donald	2004-11-29	10	T0005
P5003	Steven	2004-10-28	61	T0005
P5004	Paul	2001-09-23	17	T0005
P5005	Andrew	2004-08-24	18	T0005
P5006	Joshua	2003-07-22	7	T0005
P5007	Kevin	2005-06-22	8	T0005

```
P5008  Charles        2003-05-15      89      T0005
P5009  George 2000-04-22    99      T0005
P5010  Stephen        1999-03-09      16      T0005
P5011  Jack   2000-02-08     26      T0005
P5012  Jerry  2000-01-01     3       T0005
P6001  Mark   2002-05-22     15      T0006
P6002  Robert 2004-11-28     10      T0006
P6003  Michael        2004-10-26      61      T0006
P6004  David  2001-09-22     22      T0006
P6005  Daniel 2004-08-20     8       T0006
P6006  Charles        2003-07-20      10      T0006
P6007  Kevin  2005-06-14     12      T0006
P6008  Mathew         2003-05-25      14      T0006
P6009  Mark   2000-04-03     16      T0006
P6010  Anthony        1999-03-05      20      T0006
P6011  Donald 2000-02-14     10      T0006
P6012  Steven 2000-05-01     30      T0006
\.


COPY referees (referee_id, name, dob) FROM stdin;
R0001  Tony Joseph Louis      1975-12-20
R0002  Samar Pal      1972-08-02
R0003  Kennedy Sapam          1970-12-06
R0004  Asit Kumar Sarkar      1960-05-12
R0005  Antony Abraham         1980-04-30
R0006  Sumanta Dutta 1974-02-28
R0007  Vairamuthu Parasuraman         1979-01-25
\.


COPY teams (team_id, name, city, playground, jersey_home_color, jersey_away_color) FROM
stdin;
T0001  Amigos         London         Emirates Stadium       Red     Blue
T0002  Thunder        leeds  Villa Park      White  Red
T0003  Rainbow        Moscow         City Park      Black  White
T0004  Black Eagles   New York       Griffin Prk    Orange Black
T0005  All Stars      Pune   M S Maidan     Yellow Pink
T0006  Arawali        Hyderabad      J K Park       Pink   Yellow
\.
```

Add Primary and Foreign Key constraints:

ALTER TABLE ONLY managers
   ADD CONSTRAINT managers_pk PRIMARY KEY (mgr_id);

ALTER TABLE ONLY match_referees
   ADD CONSTRAINT match_referees_pkey PRIMARY KEY (match_num);

ALTER TABLE ONLY matches
   ADD CONSTRAINT matches_pk PRIMARY KEY (match_num);

ALTER TABLE ONLY players
   ADD CONSTRAINT players_pk PRIMARY KEY (player_id);

ALTER TABLE ONLY referees
   ADD CONSTRAINT referees_pk PRIMARY KEY (referee_id);

ALTER TABLE ONLY teams
   ADD CONSTRAINT teams_pk PRIMARY KEY (team_id);

ALTER TABLE ONLY managers
   ADD CONSTRAINT managers_fk3 FOREIGN KEY (team_id) REFERENCES
teams(team_id);

ALTER TABLE ONLY match_referees
   ADD CONSTRAINT match_referees_fk0 FOREIGN KEY (match_num) REFERENCES
matches(match_num);

ALTER TABLE ONLY match_referees
   ADD CONSTRAINT match_referees_fk2 FOREIGN KEY (referee) REFERENCES
referees(referee_id);

ALTER TABLE ONLY match_referees
   ADD CONSTRAINT match_referees_fk3 FOREIGN KEY (assistant_referee_1)
REFERENCES referees(referee_id);

ALTER TABLE ONLY match_referees
   ADD CONSTRAINT match_referees_fk4 FOREIGN KEY (assistant_referee_2)
REFERENCES referees(referee_id);

ALTER TABLE ONLY match_referees
    ADD CONSTRAINT match_referees_fk5 FOREIGN KEY (fourth_referee) REFERENCES referees(referee_id);

ALTER TABLE ONLY matches
    ADD CONSTRAINT matches_fk0 FOREIGN KEY (host_team_id) REFERENCES teams(team_id);

ALTER TABLE ONLY matches
    ADD CONSTRAINT matches_fk1 FOREIGN KEY (guest_team_id) REFERENCES teams(team_id);

ALTER TABLE ONLY players
    ADD CONSTRAINT players_fk0 FOREIGN KEY (team_id) REFERENCES teams(team_id);

Table Description Screenshots:

```
DBMS Assign=# \dt
              List of relations
 Schema |      Name       | Type  |  Owner
--------+-----------------+-------+----------
 public | managers        | table | postgres
 public | match_referees  | table | postgres
 public | matches         | table | postgres
 public | players         | table | postgres
 public | referees        | table | postgres
 public | teams           | table | postgres
(6 rows)
```

```
DBMS Assign=# \d managers
                    Table "public.managers"
  Column  |          Type          | Collation | Nullable | Default
----------+------------------------+-----------+----------+---------
 mgr_id   | character varying(10)  |           | not null |
 name     | character varying(80)  |           | not null |
 dob      | date                   |           | not null |
 team_id  | character varying(10)  |           |          |
 since    | date                   |           |          |
Indexes:
    "managers_pk" PRIMARY KEY, btree (mgr_id)
Foreign-key constraints:
    "managers_fk3" FOREIGN KEY (team_id) REFERENCES teams(team_id)


DBMS Assign=# \d players
                    Table "public.players"
  Column   |          Type          | Collation | Nullable | Default
-----------+------------------------+-----------+----------+---------
 player_id | character varying(10)  |           | not null |
 name      | character varying(80)  |           | not null |
 dob       | date                   |           | not null |
 jersey_no | integer                |           | not null |
 team_id   | character varying(10)  |           | not null |
Indexes:
    "players_pk" PRIMARY KEY, btree (player_id)
Foreign-key constraints:
    "players_fk0" FOREIGN KEY (team_id) REFERENCES teams(team_id)


DBMS Assign=# \d referees
                 Table "public.referees"
  Column   |         Type          | Collation | Nullable | Default
-----------+-----------------------+-----------+----------+---------
 referee_id | character varying(10) |           | not null |
 name       | character varying(80) |           | not null |
 dob        | date                  |           | not null |
Indexes:
    "referees_pk" PRIMARY KEY, btree (referee_id)
Referenced by:
    TABLE "match_referees" CONSTRAINT "match_referees_fk2" FOREIGN KEY (referee) REFERENCES referees(referee_id)
    TABLE "match_referees" CONSTRAINT "match_referees_fk3" FOREIGN KEY (assistant_referee_1) REFERENCES referees(referee_id)
    TABLE "match_referees" CONSTRAINT "match_referees_fk4" FOREIGN KEY (assistant_referee_2) REFERENCES referees(referee_id)
    TABLE "match_referees" CONSTRAINT "match_referees_fk5" FOREIGN KEY (fourth_referee) REFERENCES referees(referee_id)
```

```
                    Table "public.match_referees"
      Column        |         Type          | Collation | Nullable | Default
--------------------+-----------------------+-----------+----------+---------
 match_num          | character varying(10) |           | not null |
 referee            | character varying(15) |           |          |
 assistant_referee_1 | character varying(15) |          |          |
 assistant_referee_2 | character varying(15) |          |          |
 fourth_referee     | character varying(15) |           |          |
Indexes:
    "match_referees_pkey" PRIMARY KEY, btree (match_num)
Foreign-key constraints:
    "match_referees_fk0" FOREIGN KEY (match_num) REFERENCES matches(match_num)
    "match_referees_fk2" FOREIGN KEY (referee) REFERENCES referees(referee_id)
    "match_referees_fk3" FOREIGN KEY (assistant_referee_1) REFERENCES referees(referee_id)
    "match_referees_fk4" FOREIGN KEY (assistant_referee_2) REFERENCES referees(referee_id)
    "match_referees_fk5" FOREIGN KEY (fourth_referee) REFERENCES referees(referee_id)
```

```
                    Table "public.teams"
      Column       |         Type          | Collation | Nullable | Default
-------------------+-----------------------+-----------+----------+---------
 team_id           | character varying(10) |           | not null |
 name              | character varying(80) |           | not null |
 city              | character varying(80) |           | not null |
 playground        | character varying(80) |           | not null |
 jersey_home_color | character varying(80) |           |          |
 jersey_away_color | character varying(80) |           |          |
Indexes:
    "teams_pk" PRIMARY KEY, btree (team_id)
Referenced by:
    TABLE "managers" CONSTRAINT "managers_fk3" FOREIGN KEY (team_id) REFERENCES teams(team_id)
    TABLE "matches" CONSTRAINT "matches_fk0" FOREIGN KEY (host_team_id) REFERENCES teams(team_id)
    TABLE "matches" CONSTRAINT "matches_fk1" FOREIGN KEY (guest_team_id) REFERENCES teams(team_id)
    TABLE "players" CONSTRAINT "players_fk0" FOREIGN KEY (team_id) REFERENCES teams(team_id)
```

```
DBMS Assign=# \d matches
                    Table "public.matches"
      Column      |         Type          | Collation | Nullable | Default
------------------+-----------------------+-----------+----------+---------
 match_num        | character varying(10) |           | not null |
 match_date       | date                  |           | not null |
 host_team_id     | character varying(10) |           | not null |
 guest_team_id    | character varying(10) |           | not null |
 host_team_score  | integer               |           | not null |
 guest_team_score | integer               |           | not null |
Indexes:
    "matches_pk" PRIMARY KEY, btree (match_num)
Foreign-key constraints:
    "matches_fk0" FOREIGN KEY (host_team_id) REFERENCES teams(team_id)
    "matches_fk1" FOREIGN KEY (guest_team_id) REFERENCES teams(team_id)
Referenced by:
    TABLE "match_referees" CONSTRAINT "match_referees_fk0" FOREIGN KEY (match_num) REFERENCES matches(match_num)
```

match_referees

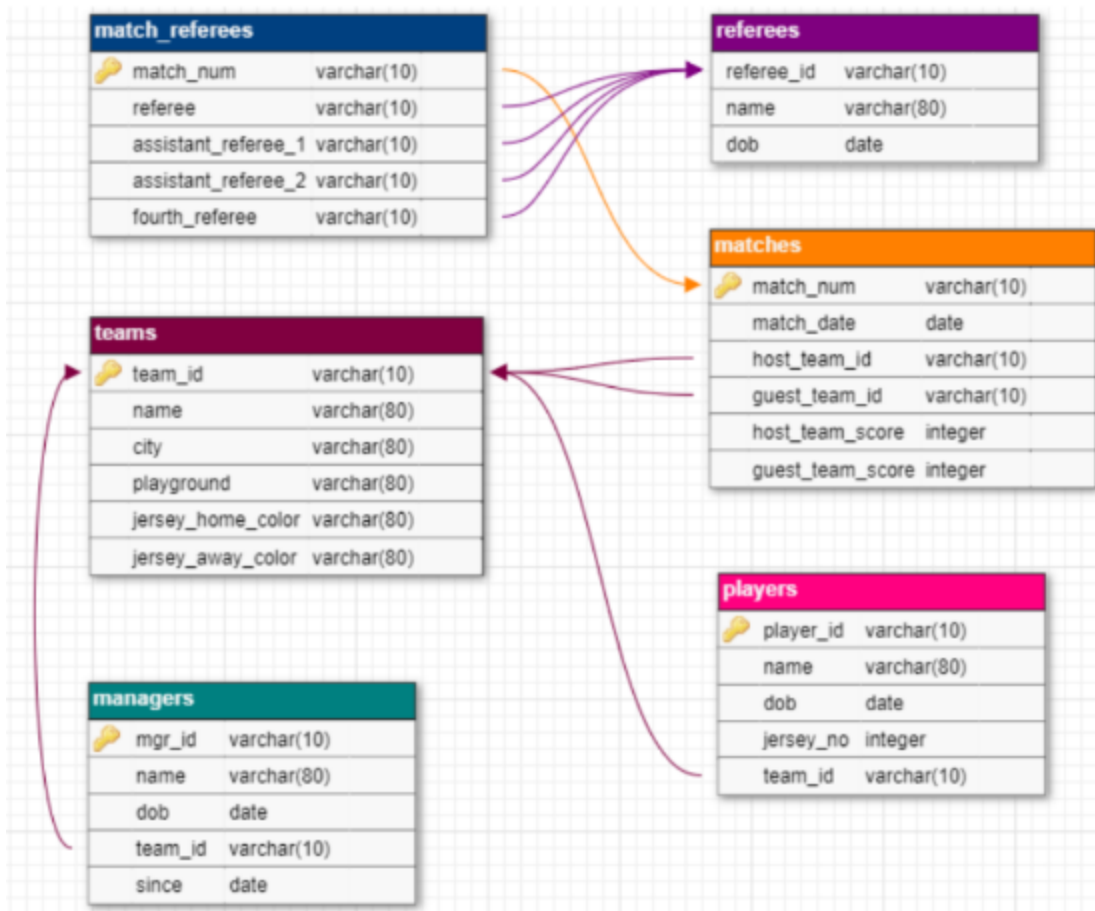|	
🔑 match_num	varchar(10)
referee	varchar(10)
assistant_referee_1	varchar(10)
assistant_referee_2	varchar(10)
fourth_referee	varchar(10)

referees

referee_id	varchar(10)
name	varchar(80)
dob	date

matches

🔑 match_num	varchar(10)
match_date	date
host_team_id	varchar(10)
guest_team_id	varchar(10)
host_team_score	integer
guest_team_score	integer

teams

🔑 team_id	varchar(10)
name	varchar(80)
city	varchar(80)
playground	varchar(80)
jersey_home_color	varchar(80)
jersey_away_color	varchar(80)

players

🔑 player_id	varchar(10)
name	varchar(80)
dob	date
jersey_no	integer
team_id	varchar(10)

managers

🔑 mgr_id	varchar(10)
name	varchar(80)
dob	date
team_id	varchar(10)
since	date

ER Diagram