g2-t2

IPL MANAGEMENT SYSTEM

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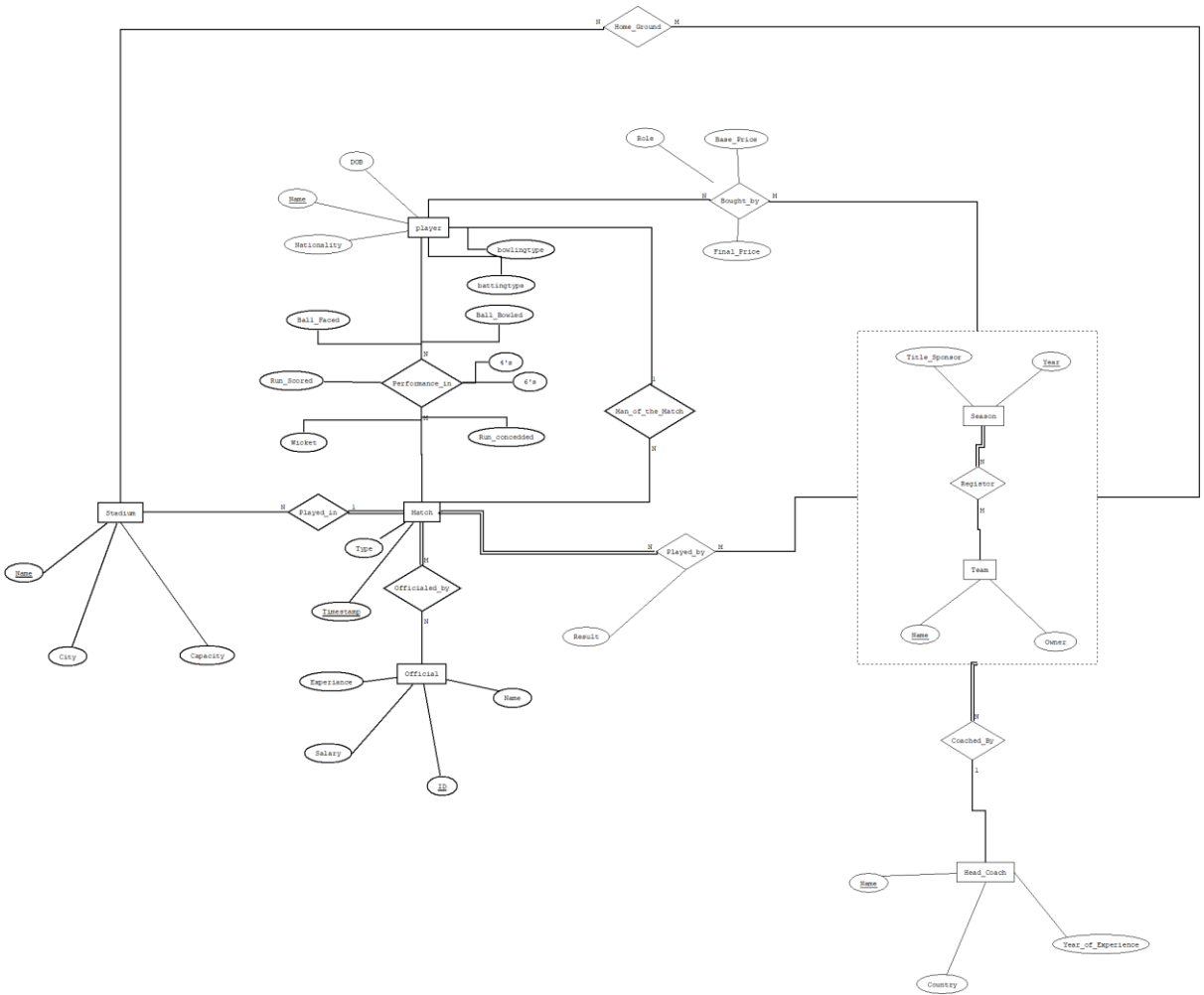
Objective:

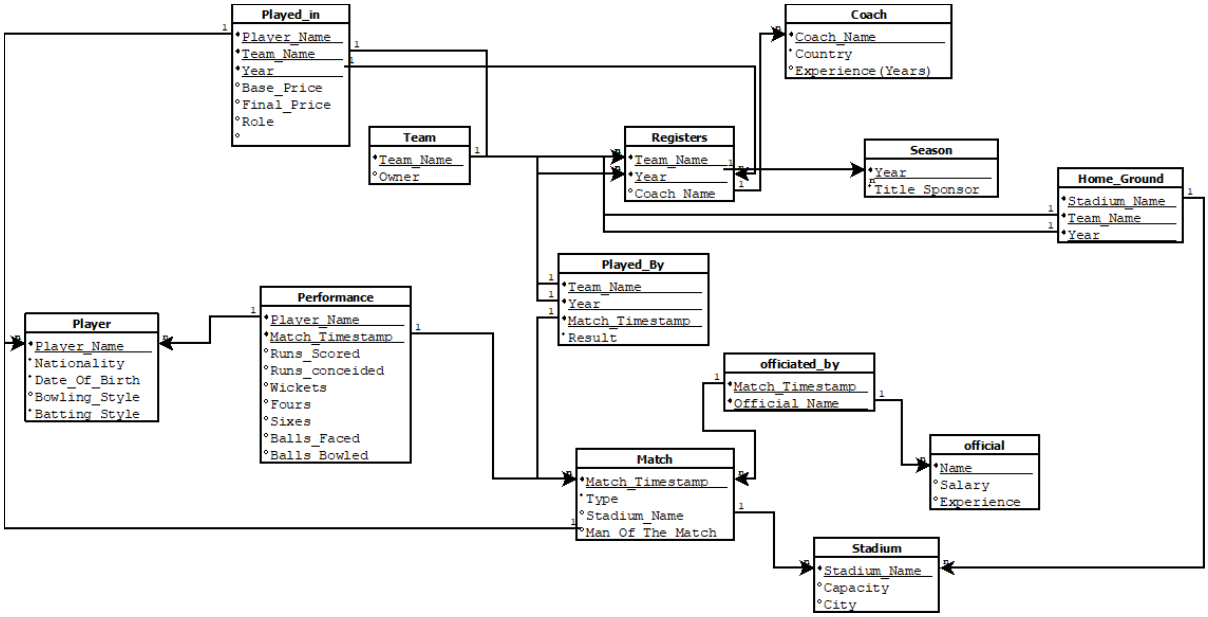
To review the ER diagram and create a relational schema. Further creating minimal FD sets. Then checking if our relations are in BCNF or not, finally crafting the DDL script.

Updated ER diagram

For greater clarity the ER diagram is pasted on the following page



Relational Schema



Minimal FD set

We have derived the minimal FD set such that all other FDs can be derived from the set of minimal FDs.

FDs

Player_name -> Nationality

Player_name -> Date_Of_Birth

Player_name -> Bowling_Style

Player_name -> Batting_Style

{Player_Name,Match_TimeStamp} -> Runs_Scored

{Player_Name,Match_TimeStamp} -> Runs_Conceided

{Player_Name,Match_TimeStamp} -> Wickets

{Player_Name,Match_TimeStamp} -> Fours

{Player_Name,Match_TimeStamp} -> Sixes

{Player_Name,Match_TimeStamp} -> Balls_Faced

{Player_Name,Match_TimeStamp} -> Balls_Bowled

{Player_Name,Team_Name, Year} -> Base_Price

{Player_Name,Team_Name, Year} -> Final_Price

{Player_Name, Team_Name, Year} -> Role

Match_Timestamp -> Type

Match_Timestamp -> Stadium_Name

Match_Timestamp -> Man_Of_The_Match

Stadium_Name -> Capacity

Stadium_Name -> City

Official_Name -> Salary

Official_Name -> Experience

{Team_Name,Year,Match_TimeStamp} -> Result

Team_Name -> Owner

{Team_Name,Year} -> Coach_Name

Coach_Name -> Country

Coach_Name -> Experience

Year -> Title_Sponsor

Proof of BCNF

1. **Player**
   - **Schema**:
     Player (Player_name, Nationality, Date_Of_Birth, Bowling_Style, Batting_Style)
   - **FDs**:
     • Player_name → Nationality, Date_Of_Birth, Bowling_Style, Batting_Style
   - **Key**:
     $Player\_name^{+}$ = {Player_name, Nationality, Date_Of_Birth, Bowling_Style, Batting_Style}
     ⇒ Candidate key = {Player_name}
   - **BCNF check**:
     The only FD has left side = {Player_name} which is the candidate key.
     ⇒ Player is in BCNF.

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2. **Performance**
   - **Schema**:
     Performance(Player_Name, Match_TimeStamp,

Runs_Scored, Runs_Conceided, Wickets, Fours, Sixes, Balls_Faced, Balls_Bowled)

- **FDs**:
  • {Player_Name, Match_TimeStamp} → Runs_Scored, Runs_Conceided, Wickets, Fours, Sixes, Balls_Faced, Balls_Bowled
- **Key**:
  $\{Player\_Name, Match\_TimeStamp\}^+$ = all attributes of the relation
  ⇒ Candidate key = {Player_Name, Match_TimeStamp}
- **BCNF check**:
  The FD's left side is the candidate key.
  ⇒ Performance is in BCNF.

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3. **Match**
   - **Schema**:
     Match(Match_Timestamp, Type, Stadium_Name, Man_Of_The_Match)
   - **FDs**:
     • Match_Timestamp → Type, Stadium_Name, Man_Of_The_Match
   - **Key**:
     $Match\_Timestamp^+$ = {Match_Timestamp, Type, Stadium_Name, Man_Of_The_Match}
     ⇒ Candidate key = {Match_Timestamp}
   - **BCNF check**:
     The FD's left side is the candidate key.
     ⇒ Match is in BCNF.

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4. **Stadium**

- **Schema**:
  Stadium(Stadium_Name, Capacity, City)
- **FDs**:
  • Stadium_Name → Capacity, City
- **Key**:
  $Stadium\_Name^+$ = {Stadium_Name, Capacity, City}
  ⇒ Candidate key = {Stadium_Name}
- **BCNF check**:
  Left side is the candidate key.
  ⇒ Stadium is in BCNF.

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5. **Official**
   - **Schema**:
     Official(Official_Name, Salary, Experience)
   - **FDs**:
     • Official_Name → Salary, Experience
   - **Key**:
     $Official\_Name^+$ = {Official_Name, Salary, Experience}
     ⇒ Candidate key = {Official_Name}
   - **BCNF check**:
     Left side is the candidate key.
     ⇒ Official is in BCNF.

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6. **Played_By**
   - **Schema**:
     Played_By(Team_Name, Year, Match_TimeStamp, Result)
   - **FDs**:
     • {Team_Name, Year, Match_TimeStamp} → Result

- **Key**:
  {Team_Name, Year, Match_TimeStamp}$^+$ = all attributes ⇒ Candidate key = {Team_Name, Year, Match_TimeStamp}
- **BCNF check**:
  FD's left side is the candidate key.
  ⇒ Played_By is in BCNF.

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7. **Team**
   - **Schema**:
     Team(Team_Name, Owner)
   - **FDs**:
     • Team_Name → Owner
   - **Key**:
     Team_Name$^+$ = {Team_Name, Owner}
     ⇒ Candidate key = {Team_Name}
   - **BCNF check**:
     Left side is the candidate key.
     ⇒ Team is in BCNF.

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8. **Coach**
   - **Schema**:
     Coach(Coach_Name, Country, Experience)
   - **FDs**:
     • Coach_Name → Country, Experience
   - **Key**:
     Coach_Name$^+$ = {Coach_Name, Country, Experience}
     ⇒ Candidate key = {Coach_Name}

- **BCNF check**:
  Left side is the candidate key.
  ⇒ Coach is in BCNF.

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9. **Registers**
   - **Schema**:
     Registers(Team_Name, Year, Coach_Name)
   - **FDs**:
     • {Team_Name, Year} → Coach_Name
   - **Key**:
     $\{Team\_Name, Year\}^+$ = {Team_Name, Year, Coach_Name}
     ⇒ Candidate key = {Team_Name, Year}
   - **BCNF check**:
     FD's left side is the candidate key.
     ⇒ Registers is in BCNF.

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10. **Season**
    - **Schema**:
      Season(Year, Title_Sponsor)
    - **FDs**:
      • Year → Title_Sponsor
    - **Key**:
      $Year^+$ = {Year, Title_Sponsor}
      ⇒ Candidate key = {Year}
    - **BCNF check**:
      Left side is the candidate key.
      ⇒ Season is in BCNF.

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11. Played_In

- **Schema**
  PlayedIn(Year, Team_Name, Player_Name, Base_Price, Final_Price, Role)
- **FDs:**
  - {Team_Name, Year, Player_Name} -> Base_Price
  - {Team_Name, Year, Player_Name} ->Final_Price
  - {Team_Name, Year, Player_Name} ->Role
- **Key**
  {Team_Name, Year, Player_Name}+ = {Year, Team_Name,Player_Name, Base_Price, Final_Price, Role}
- **BCNF**
  Left side is the candidate key.
  ⇒ Season is in BCNF.

Overall Conclusion:

Every non-trivial FD in each relation has a left-hand side that is a candidate key for that relation. Therefore **all** of the above relations are in BCNF.

Summary

With this we have completed this third part of our project we made the relational schema according to the methods taught in class so our relationships ended up being in BCNF