CRICKET TOURNAMENT DATABASE

A PROJECT REPORT

Submitted by

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Under the Guidance of

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In partial fulfilment of the requirements for the degree of

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with a specialization in Internet of Things

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SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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BONAFIDE CERTIFICATE

Certified that this B.Tech project report titled "**Cricket Tournament Database**" is the bonafide work of **"YAFFIN S[RA2211032010053], SAKINA RIZVI[RA2211032010073] and MITUN M[RA2211032010090]"** who carried out the project work under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion for this or any other candidate.

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Own Work Declaration Form

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Title of Work : CRICKET TOURNAMENT DATABASE

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ABSTRACT

Cricket is the most popular sport in South Asian countries and the second most popular sport globally. Businesses have grown enormously based on cricketing sports events from the last decade. Also, coaches, sports analysts, and technicians get game facts and ideas about other teams, which help them make decisions and change plans accordingly. The Cricket Tournament Database System is a comprehensive and efficient solution designed to manage and streamline the operations of cricket tournaments. This system leverages modern database technologies to provide a centralized platform for storing, retrieving, and managing various aspects related to cricket tournaments. The primary objective is to enhance the overall efficiency, transparency, and organization of cricket tournaments, catering to the needs of tournament organizers, teams, players, and spectators.

PROBLEM STATEMENT

The existing problem in managing cricket tournaments lies in the manual and disjointed processes of handling team information, player data, match details, and statistical analysis. Currently, there is a lack of centralized and automated systems to manage these aspects efficiently, leading to errors, data inconsistencies, and inefficiencies. The need for a Cricket Tournament Management System database arises from these challenges, aiming to streamline and automate the management of teams, players, matches, and statistics. By implementing a database system using SQL technologies like MySQL or PostgreSQL, the objective is to eliminate manual data handling, ensure data accuracy and integrity, and provide functionalities for easy retrieval, analysis, and reporting of tournament-related information.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

This DBMS project is based on Cricket Tournament management. It provides various information about the various teams participating in the Tournament, in which various teams participate. It also provides us with information about the various players participating in the tournament. The database contains details of players, coaches and umpires among others. All the useful information about the entire World Cup can be found here.

Managing the intricacies of cricket tournaments, ranging from scheduling matches to tracking player statistics, has become a complex task. To address the challenges associated with organizing and overseeing cricket tournaments, the Cricket Tournament Database System serves as a pivotal solution.

Managing cricket tournament data poses several challenges, including fragmentation across various sources, inconsistent data quality, limited accessibility, manual data entry processes, lack of standardization, limited analytical capabilities, and scalability concerns. Addressing these challenges requires the development of a centralized database with comprehensive coverage, high data quality, accessible for all stakeholders, automated management processes, standardized formats, advanced analytics, and scalable infrastructure. This database would enhance the cricketing experience, drive innovation, and support growth within the sport.

The system caters to the diverse needs of tournament organizers, teams, players, and enthusiasts by providing a centralized and efficient database infrastructure.

CHAPTER 2

OBJECTIVES

- **Efficient Tournament Management:**

  Allow organizers to define tournament formats, rules, and regulations, tailoring the system to meet the specific requirements of each event.

- **Comprehensive Information Management:**

  Maintain a centralized database containing detailed information about participating teams and players, including historical statistics, performance metrics, and player profiles. Store and manage comprehensive data about matches, including schedules, venues, umpires, and match results.

- **Data Analysis and Reporting:**

  Provide tools for in-depth analysis of tournament data, enabling organizers, teams, and analysts to derive valuable insights. Generate customizable reports on various aspects such as player performances, team standings, and overall tournament statistics.

- **Data Analysis and Reporting:**

  Maintain an extensive historical archive of past tournaments, matches, and player performances, facilitating the tracking of cricketing milestones and trends over time. Allow users to retrieve and analyze historical data for research, comparison, and benchmarking purposes.

CHAPTER 3

REQUIREMENT ANALYSIS

NEED FOR CRICKET TOURNAMENT DB:

The need for a Cricket Database System aims to address is the lack of an efficient and centralized means to manage and organize the vast and intricate data associated with the sport of cricket. Without such a system, there are challenges in maintaining comprehensive records of players, teams, matches, and related statistics. The absence of a structured platform makes it difficult for stakeholders, including players, coaches, analysts, fans, and administrators, to access and analyze historical and real-time cricket data easily. Manual record-keeping may lead to inaccuracies, and the absence of a standardized system can impede data-driven insights and decision-making processes.

SOLUTION:

The solution to the challenge of inefficient cricket data management lies in the development and implementation of a robust Cricket Database System. This system serves as a centralized hub, meticulously organizing comprehensive information about players, teams, matches, and statistics. By creating an intuitive and user-friendly interface, accessible to players, coaches, analysts, and administrators, the system ensures ease of use and widespread adoption. Detailed player profiles, team management modules, and match scheduling functionalities contribute to a comprehensive and well-structured database.

CHAPTER 4

ENTITY RELATIONSHIP DIAGRAM

4.1 Entities

1) **Team** is an entity type which has many attributes like Team Name which uses the data type varchar. Every team has been given a Team ID which is the primary key which is of data type varchar. Team Ranking, Number of Batsmen and Number of Bowlers are of the data type number. There is another attribute - Wicketkeeper which is of multivalued type and accepts varchar data type. Primary key cannot have null value.
2) **Players** is an entity type which has an attribute – Player Name which is of the data type varchar. It has a primary key, Player ID, which cannot have null value. It has a foreign key, Team ID which is the primary key of the entity, Team. There is a complex attribute, Number of matches played, which comprises of Number of Test Matches, Number of T20 Matches, Number of World Cup Matches and Number of ODIs
3) **Batsman** is an entity type which has the attributes – Number of sixes hit, Number of Fours hit, the batting average, and the total runs scored. All of these attributes are of the data type number.
4) **Bowler** is an entity type which has the attribute – type of batsman with varchar data type. It also includes number of wickets and economy which are of the data type number.
5) **Umpire** is an entity type which has the attributes name and country of origin of data type varchar. The primary key of this is Umpire Id which is of varchar data type. It also has an attribute Number of matches of data type number.

6) **Coach** is an entity type with a foreign key, Team ID, which is a primary key of entity type, Team. It has a primary key, Coach ID, of data type varchar. It also has another attribute of data type varchar, Name.

7) **Captain** is an entity type with a primary key, Captain ID of data type varchar. It has two foreign keys, i) Player id from table Players and ii) Team ID from table Team. Number of years of captaincy and Number of wins are also attributes of this table of data type number.

8) **Matches** is an entity type with a primary key, match ID, of varchar data type. It has attributes like Team1 Name, Team2 Name, Stadium, Winner Team and Loser Team of data type varchar. Match date is an attribute which uses the datatype date. Match time is an attribute which is of the data type time.

4.2 RELATIONSHIPS

1) **Cricket player plays in team (N-1)**

A cricket player can play in only one team but a team can have many players in it but a team must have players in it. So, the relationship becomes (N-1).

2) **Coach manages team(1-N)**

Coach can manage a single team, but each team can have many coaches (like batting coach, fielding coach, bowling coach). But it is compulsory for a team to have a coach. So, the relationship is 1-N

3) **Team plays match(M-N)**

Team can play many matches and a match can be played by two teams. So, the relationship is M-N.

4) **Matches are umpired by Umpire(M-N)**

An umpire can umpire in many matches and a match can have two umpires. So, the relationship is M-N

5) **Team headed by a Captain (1-1)**

A team has 1 captain and a captain is from single team only. So the relationship is 1-1.

The below figure 4.1 depicts the Entity Relationship Diagram for the Cricket Tournament database.

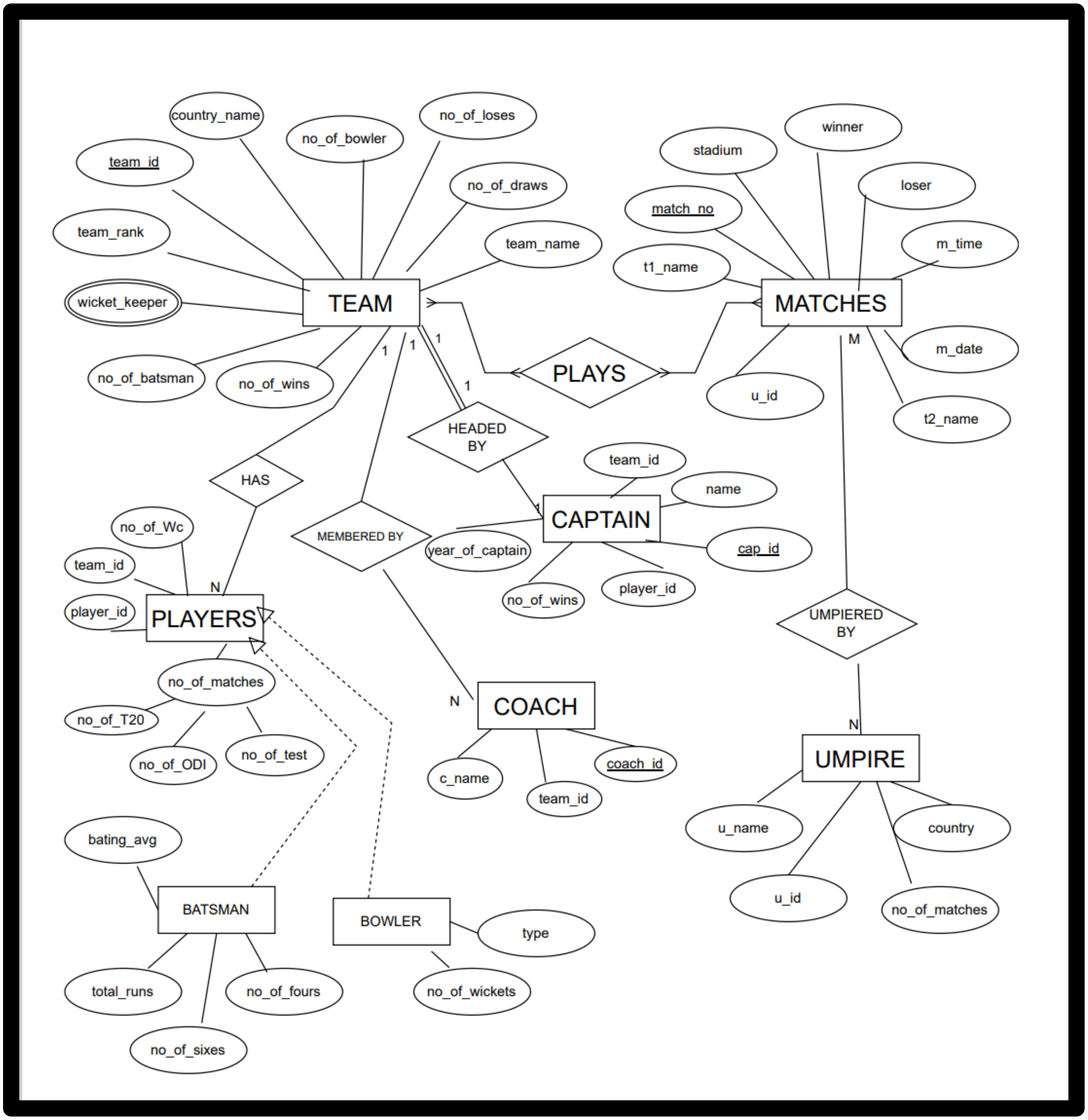

country_name
no_of_loses
no_of_bowler
team_id
no_of_draws
team_rank
team_name
wicket_keeper
TEAM
no_of_batsman
no_of_wins
1
1
1
1
winner
stadium
loser
match_no
m_time
t1_name
MATCHES
M
m_date
u_id
t2_name
PLAYS
HEADED BY
HAS
team_id
name
MEMBERED BY
CAPTAIN
1
year_of_captain
cap_id
no_of_Wc
no_of_wins
player_id
team_id
N
player_id
PLAYERS
UMPIERED BY
no_of_matches
N
COACH
no_of_T20
N
UMPIRE
no_of_ODI
no_of_test
c_name
coach_id
team_id
u_name
country
bating_avg
u_id
no_of_matches
BATSMAN
BOWLER
type
total_runs
no_of_fours
no_of_wickets
no_of_sixes

Figure 4.1

CHAPTER 5

RELATIONAL DATABASE SCHEMA

The below figure 5.1 shows the Relational Database Schema for Cricket Tournament Database

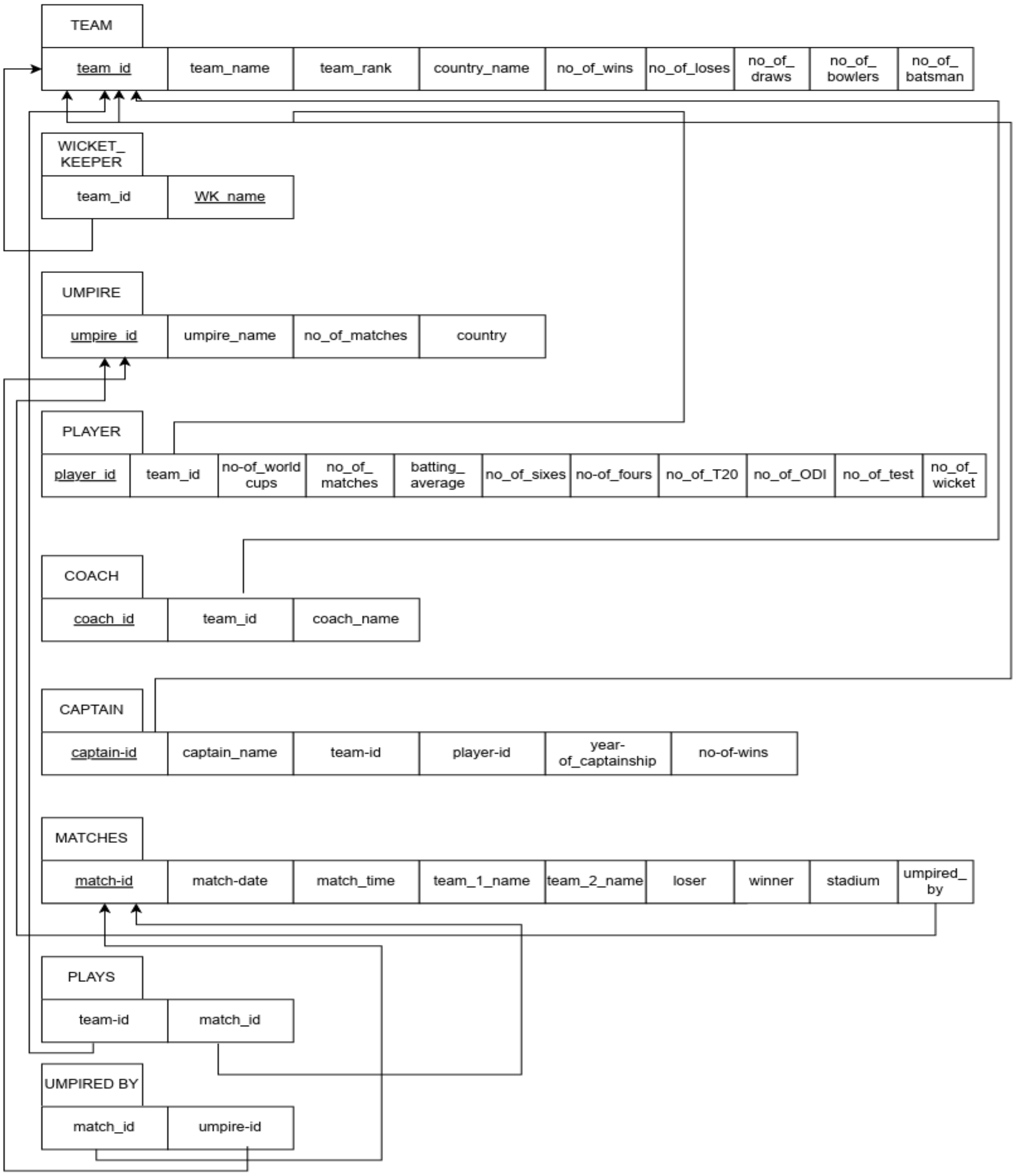


Figure 5.1

CHAPTER 6

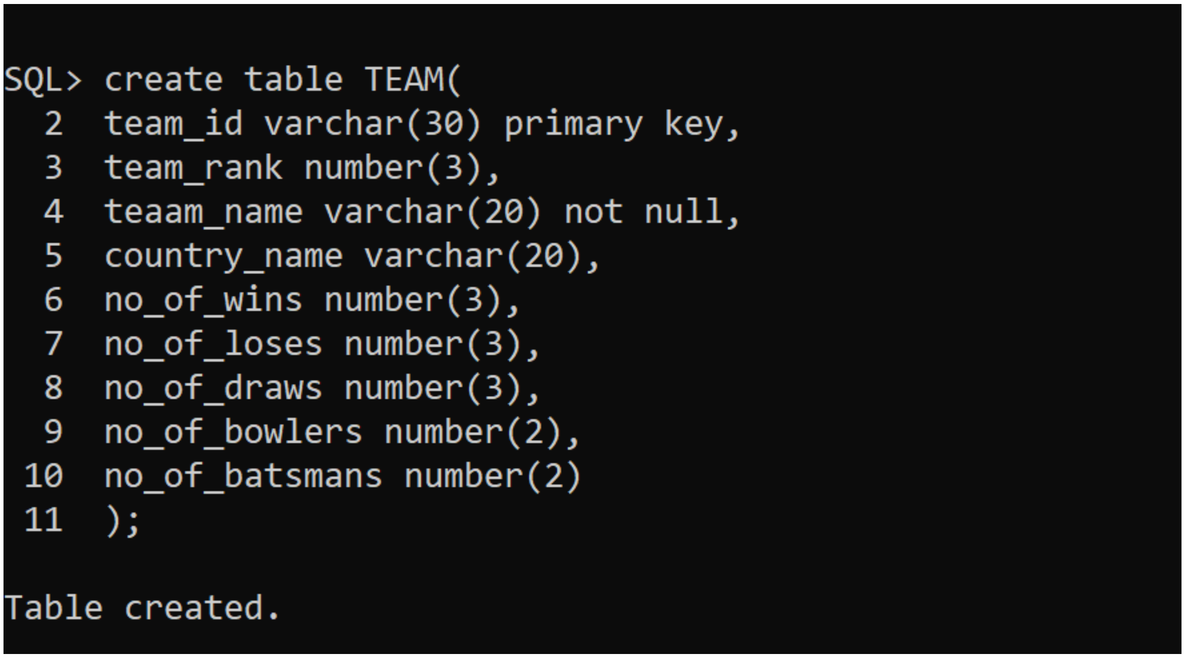
TABLES

- Team
- Wicket_Keeper
- Umpire
- Player
- Coach
- Captain
- Matches
- Plays
- Umpired_By

6.1. TABLE CREATION

1. TABLE TEAM

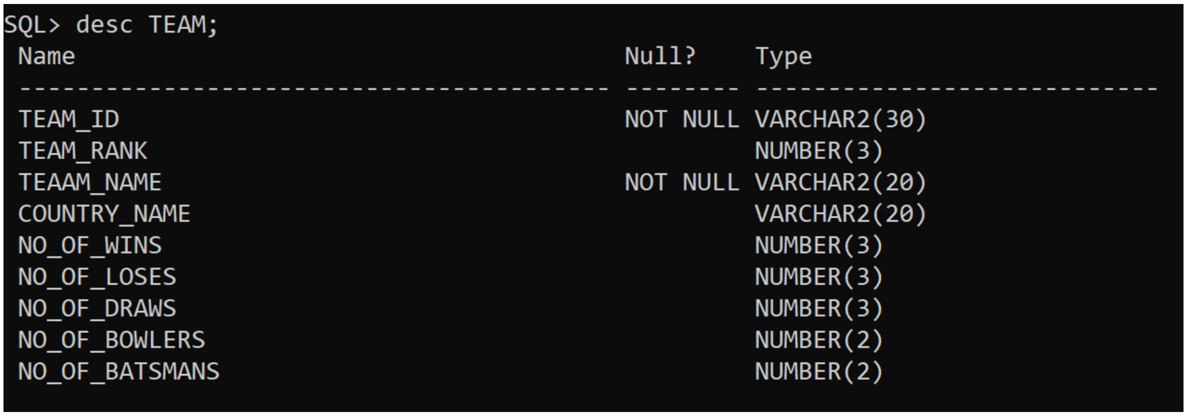
The table TEAM has columns team_id, team_rank, team_name, country_name, no_of_wins, no_of_loses, no_of_draws, no_of_bowlers, no_of_batsman. as shown in fig 6.1.1



```
SQL> create table TEAM(
  2  team_id varchar(30) primary key,
  3  team_rank number(3),
  4  teaam_name varchar(20) not null,
  5  country_name varchar(20),
  6  no_of_wins number(3),
  7  no_of_loses number(3),
  8  no_of_draws number(3),
  9  no_of_bowlers number(2),
 10  no_of_batsmans number(2)
 11  );

Table created.
```

Figure 6.1.1

Describing the schema of the table TEAM as shown in fig 6.1.2

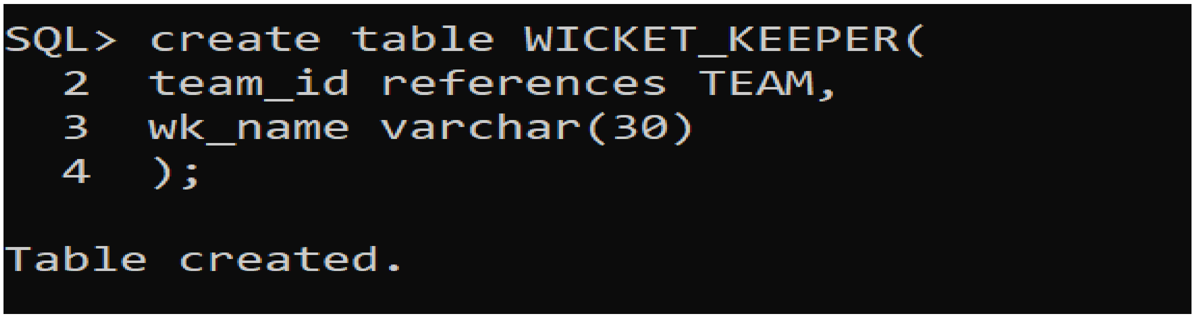


```
SQL> desc TEAM;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 TEAM_ID                                   NOT NULL VARCHAR2(30)
 TEAM_RANK                                          NUMBER(3)
 TEAAM_NAME                                NOT NULL VARCHAR2(20)
 COUNTRY_NAME                                       VARCHAR2(20)
 NO_OF_WINS                                         NUMBER(3)
 NO_OF_LOSES                                        NUMBER(3)
 NO_OF_DRAWS                                        NUMBER(3)
 NO_OF_BOWLERS                                      NUMBER(2)
 NO_OF_BATSMANS                                     NUMBER(2)
```

Figure 6.1.2

2.TABLE WICKET_KEEPER

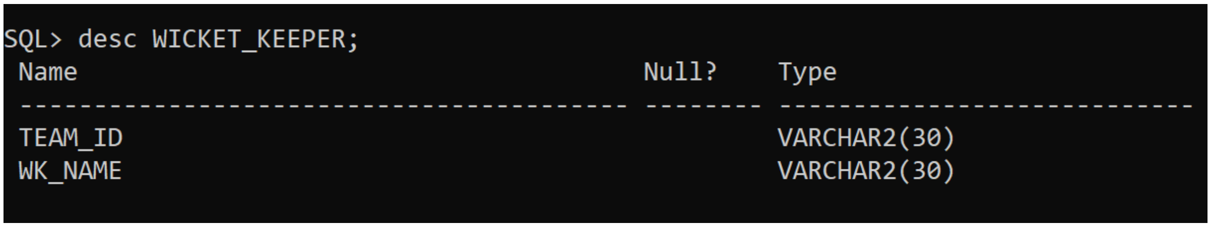
The table WICKET_KEEPER has the columns team_id,wk_name. as shown in fig 6.2.1



```
SQL> create table WICKET_KEEPER(
  2  team_id references TEAM,
  3  wk_name varchar(30)
  4  );

Table created.
```

Figure 6.2.1

Describing the schema of the table WICKET_KEEPER as shown in fig 6.2.2

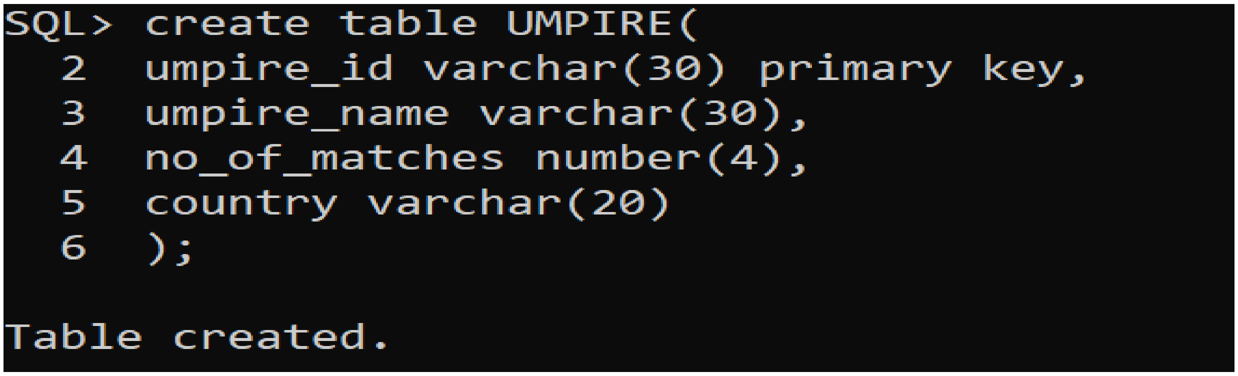


```
SQL> desc WICKET_KEEPER;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 TEAM_ID                                            VARCHAR2(30)
 WK_NAME                                            VARCHAR2(30)
```

Figure 6.2.2

3.TABLE UMPIRE

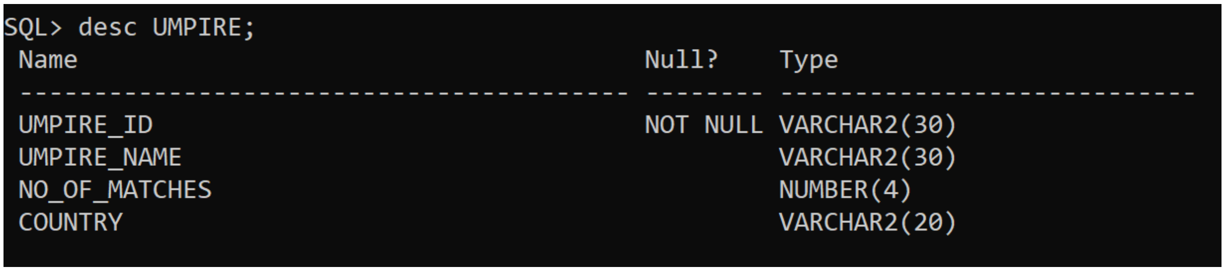
The table UMPIRE has the columns umpire_id, umpire_name, no_of_matches as shown in fig 6.3.1



```
SQL> create table UMPIRE(
     umpire_id varchar(30) primary key,
     umpire_name varchar(30),
     no_of_matches number(4),
     country varchar(20)
     );

Table created.
```

Figure 6.3.1

Describing the structure of the table UMPIRE as shown in fig 6.3.2

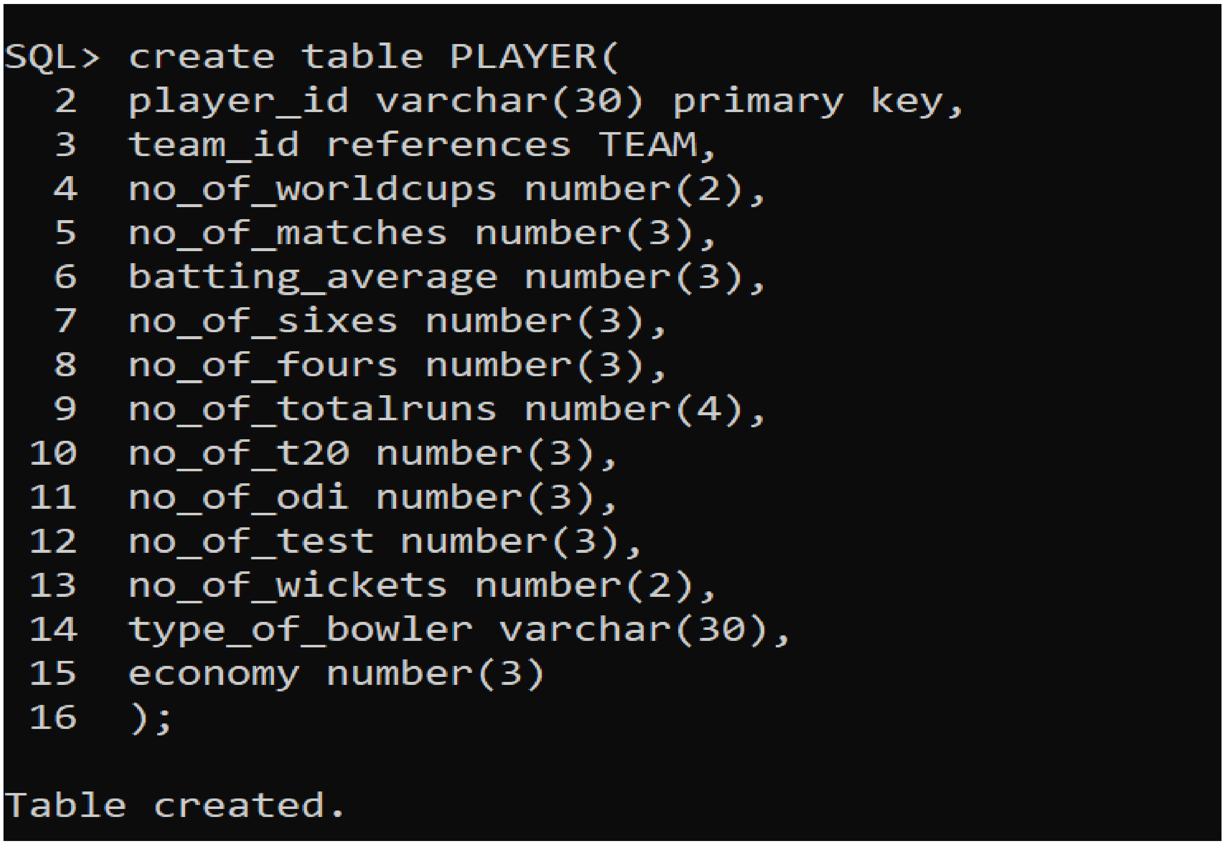


```
SQL> desc UMPIRE;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 UMPIRE_ID                                 NOT NULL VARCHAR2(30)
 UMPIRE_NAME                                        VARCHAR2(30)
 NO_OF_MATCHES                                      NUMBER(4)
 COUNTRY                                            VARCHAR2(20)
```

Figure 6.3.2

4.TABLE PLAYER

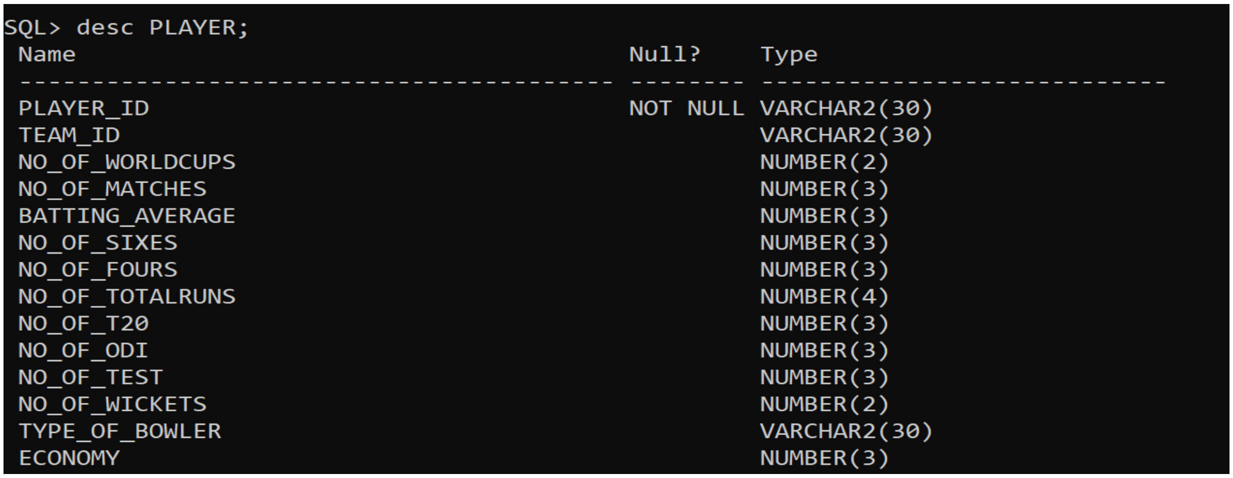
The table player has the attributes player_id, team_id, no_of_worldcups, no_of_matches, batting_average, no_of_sixes, no_of_fours, no_of_totalruns, no_of_t20, no_of_odi, no_of_test, no_of_wickets, type_of_bowler as shown in fig 6.4.1



```
SQL> create table PLAYER(
  2  player_id varchar(30) primary key,
  3  team_id references TEAM,
  4  no_of_worldcups number(2),
  5  no_of_matches number(3),
  6  batting_average number(3),
  7  no_of_sixes number(3),
  8  no_of_fours number(3),
  9  no_of_totalruns number(4),
 10  no_of_t20 number(3),
 11  no_of_odi number(3),
 12  no_of_test number(3),
 13  no_of_wickets number(2),
 14  type_of_bowler varchar(30),
 15  economy number(3)
 16  );

Table created.
```

Figure 6.4.1

Describing the table PLAYER as shown in the fig 6.4.2

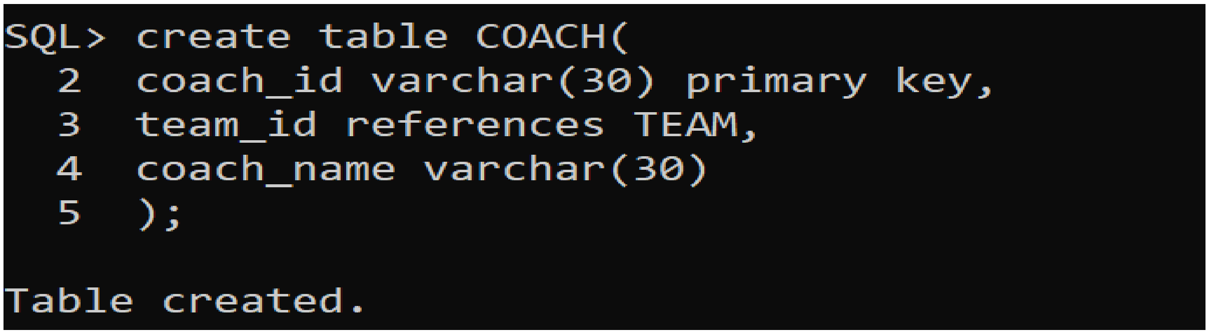


```
SQL> desc PLAYER;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 PLAYER_ID                                 NOT NULL VARCHAR2(30)
 TEAM_ID                                            VARCHAR2(30)
 NO_OF_WORLDCUPS                                    NUMBER(2)
 NO_OF_MATCHES                                      NUMBER(3)
 BATTING_AVERAGE                                    NUMBER(3)
 NO_OF_SIXES                                        NUMBER(3)
 NO_OF_FOURS                                        NUMBER(3)
 NO_OF_TOTALRUNS                                    NUMBER(4)
 NO_OF_T20                                          NUMBER(3)
 NO_OF_ODI                                          NUMBER(3)
 NO_OF_TEST                                         NUMBER(3)
 NO_OF_WICKETS                                      NUMBER(2)
 TYPE_OF_BOWLER                                     VARCHAR2(30)
 ECONOMY                                            NUMBER(3)
```

Figure 6.4.2

5.TABLE COACH

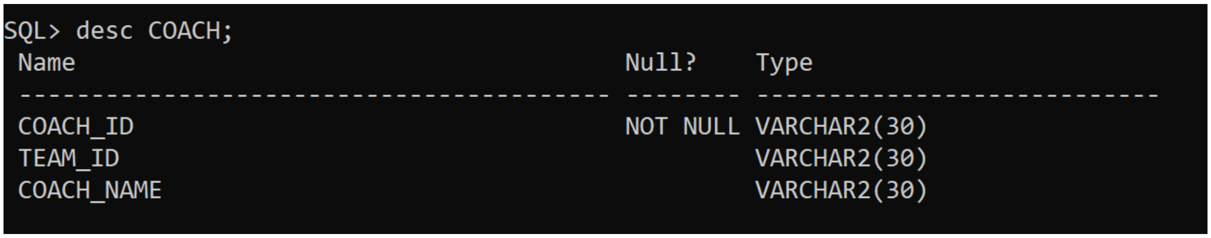
The table COACH has the columns coach_id, team_id, coach_name. as shown in fig 6.5.1



```
SQL> create table COACH(
  2  coach_id varchar(30) primary key,
  3  team_id references TEAM,
  4  coach_name varchar(30)
  5  );

Table created.
```

Figure 6.5.1

Describing the table COACH as shown in fig 6.5.2

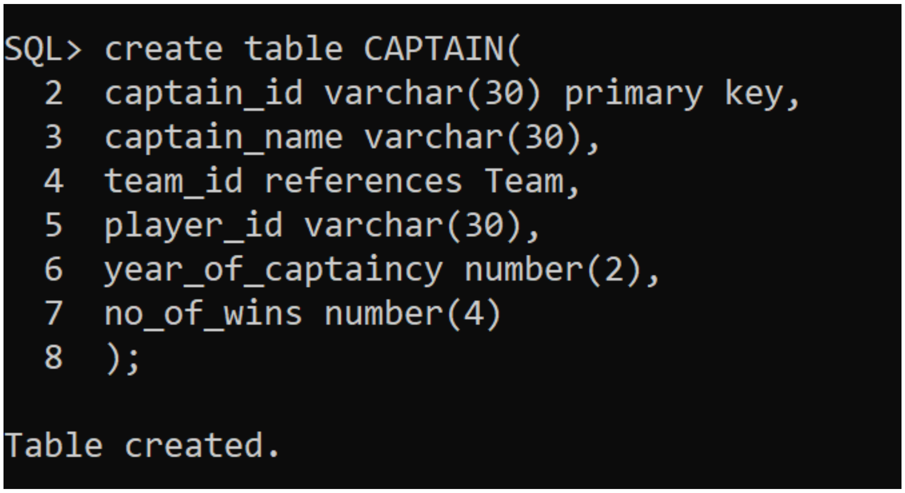


```
SQL> desc COACH;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 COACH_ID                                  NOT NULL VARCHAR2(30)
 TEAM_ID                                            VARCHAR2(30)
 COACH_NAME                                         VARCHAR2(30)
```

Figure 6.5.2

6.TABLE CAPTAIN

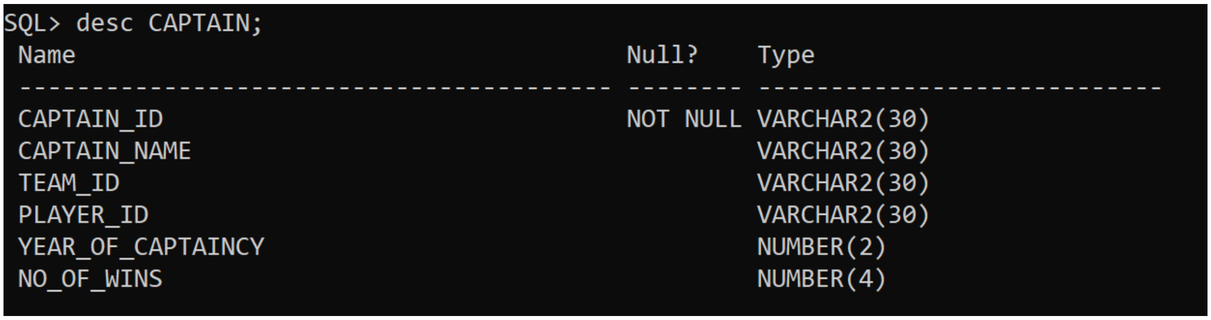
The table CAPTAIN has the attributes captain-id, captain_name, team-id, player_id, year_of_captaincy, no_of_wins. as shown in fig 6.6.1



```
SQL> create table CAPTAIN(
  2  captain_id varchar(30) primary key,
  3  captain_name varchar(30),
  4  team_id references Team,
  5  player_id varchar(30),
  6  year_of_captaincy number(2),
  7  no_of_wins number(4)
  8  );

Table created.
```

Figure 6.6.1

Describing the table CAPTAIN as shown in fig 6.6.2

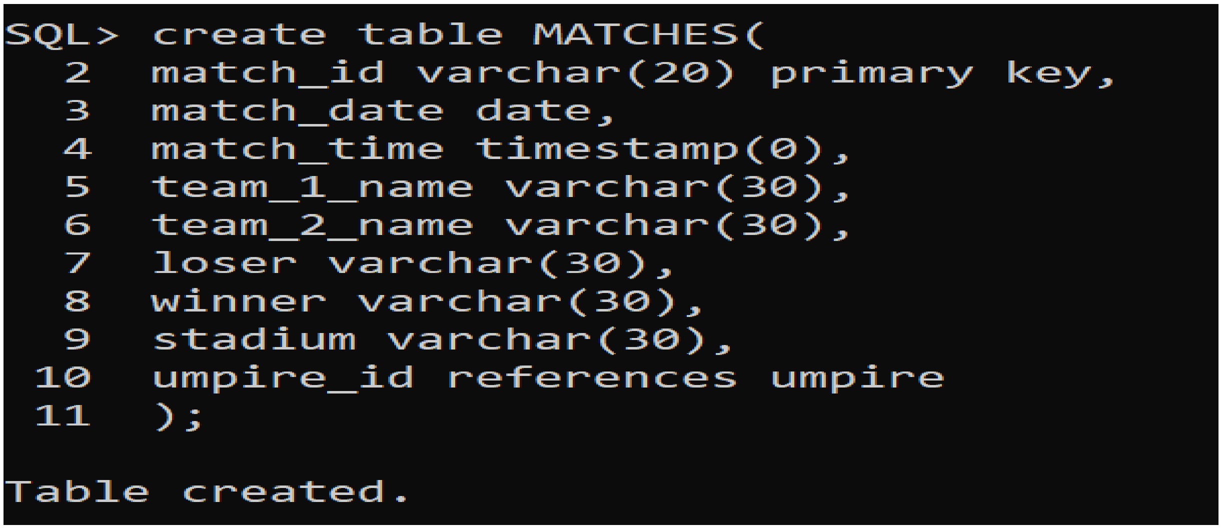


```
SQL> desc CAPTAIN;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 CAPTAIN_ID                                NOT NULL VARCHAR2(30)
 CAPTAIN_NAME                                       VARCHAR2(30)
 TEAM_ID                                            VARCHAR2(30)
 PLAYER_ID                                          VARCHAR2(30)
 YEAR_OF_CAPTAINCY                                  NUMBER(2)
 NO_OF_WINS                                         NUMBER(4)
```

Figure 6.6.2

7.TABLE UMPIRE

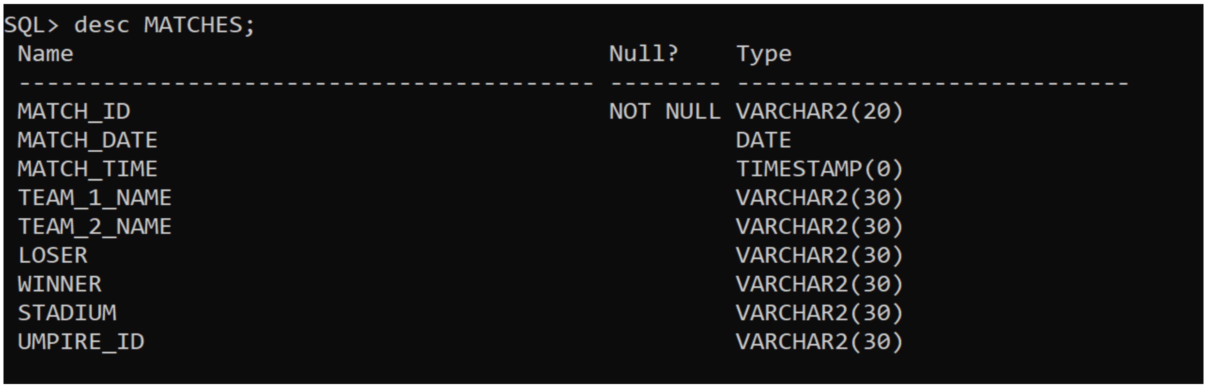
The table MATCHES has the attributes match_id, match_date, match_time, team_1_name, Team_2_name, loser, winner, stadium, umpire_id. as shown in fig 6.7.1



```
SQL> create table MATCHES(
  2  match_id varchar(20) primary key,
  3  match_date date,
  4  match_time timestamp(0),
  5  team_1_name varchar(30),
  6  team_2_name varchar(30),
  7  loser varchar(30),
  8  winner varchar(30),
  9  stadium varchar(30),
 10  umpire_id references umpire
 11  );

Table created.
```

Figure 6.7.1

Describing the table MATCHES as shown in fig 6.7.2

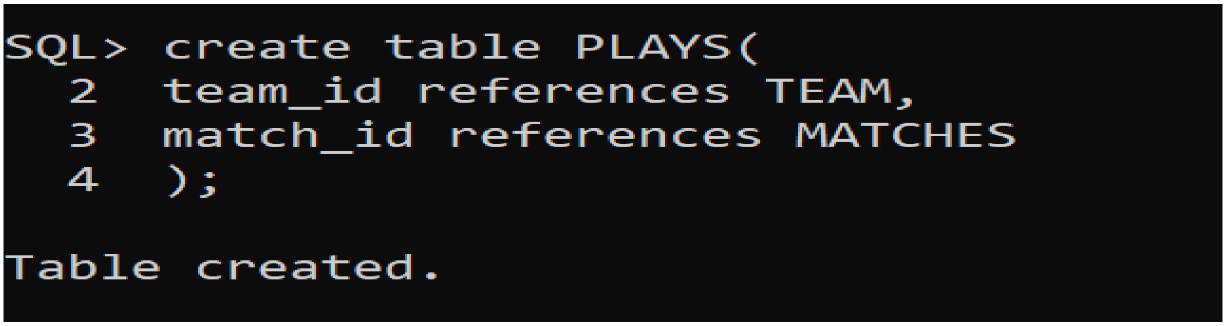


```
SQL> desc MATCHES;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 MATCH_ID                                  NOT NULL VARCHAR2(20)
 MATCH_DATE                                         DATE
 MATCH_TIME                                         TIMESTAMP(0)
 TEAM_1_NAME                                        VARCHAR2(30)
 TEAM_2_NAME                                        VARCHAR2(30)
 LOSER                                              VARCHAR2(30)
 WINNER                                             VARCHAR2(30)
 STADIUM                                            VARCHAR2(30)
 UMPIRE_ID                                          VARCHAR2(30)
```

Figure 6.7.2

8.TABLE PLAYS

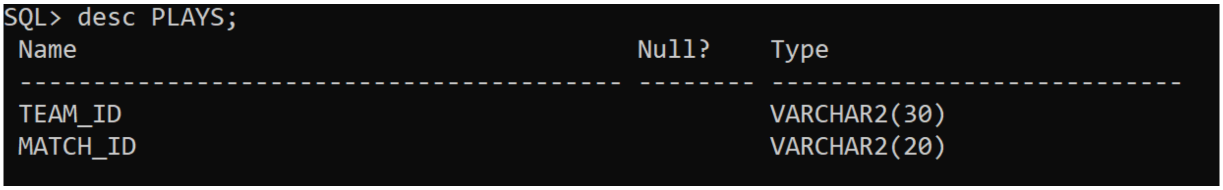
The Table PLAYS has the attributes team_id, match-id as shown in fig 6.8.1



```
SQL> create table PLAYS(
  2  team_id references TEAM,
  3  match_id references MATCHES
  4  );

Table created.
```

Figure 6.8.1

Describing the table PLAYS. as shown in fig 6.8.2

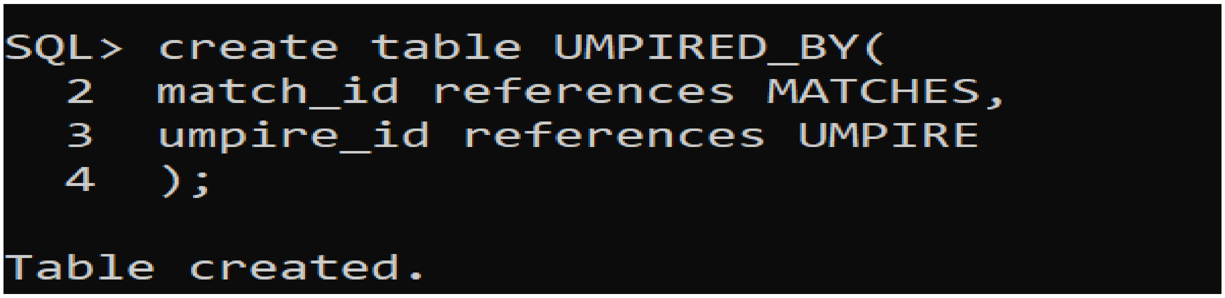


```
SQL> desc PLAYS;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 TEAM_ID                                            VARCHAR2(30)
 MATCH_ID                                           VARCHAR2(20)
```

Figure 6.8.2

9.TABLE UMPIRED_BY

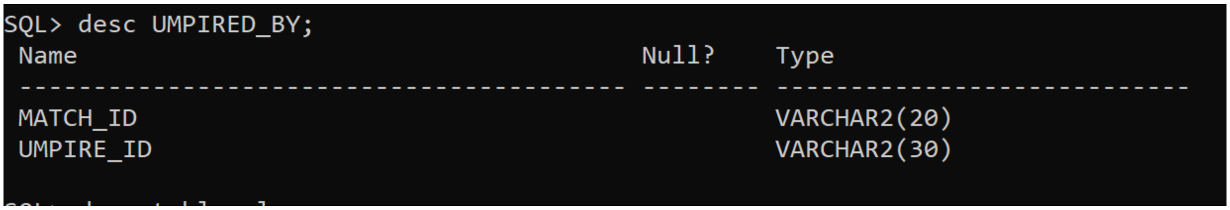
The table UMPIRED_BY has the attributes match_id, umpire_id. as shown in fig 6.9.1



```
SQL> create table UMPIRED_BY(
  2  match_id references MATCHES,
  3  umpire_id references UMPIRE
  4  );

Table created.
```

Figure 6.9.1

Describing the table UMPIRED_BY as shown in fig 6.9.2



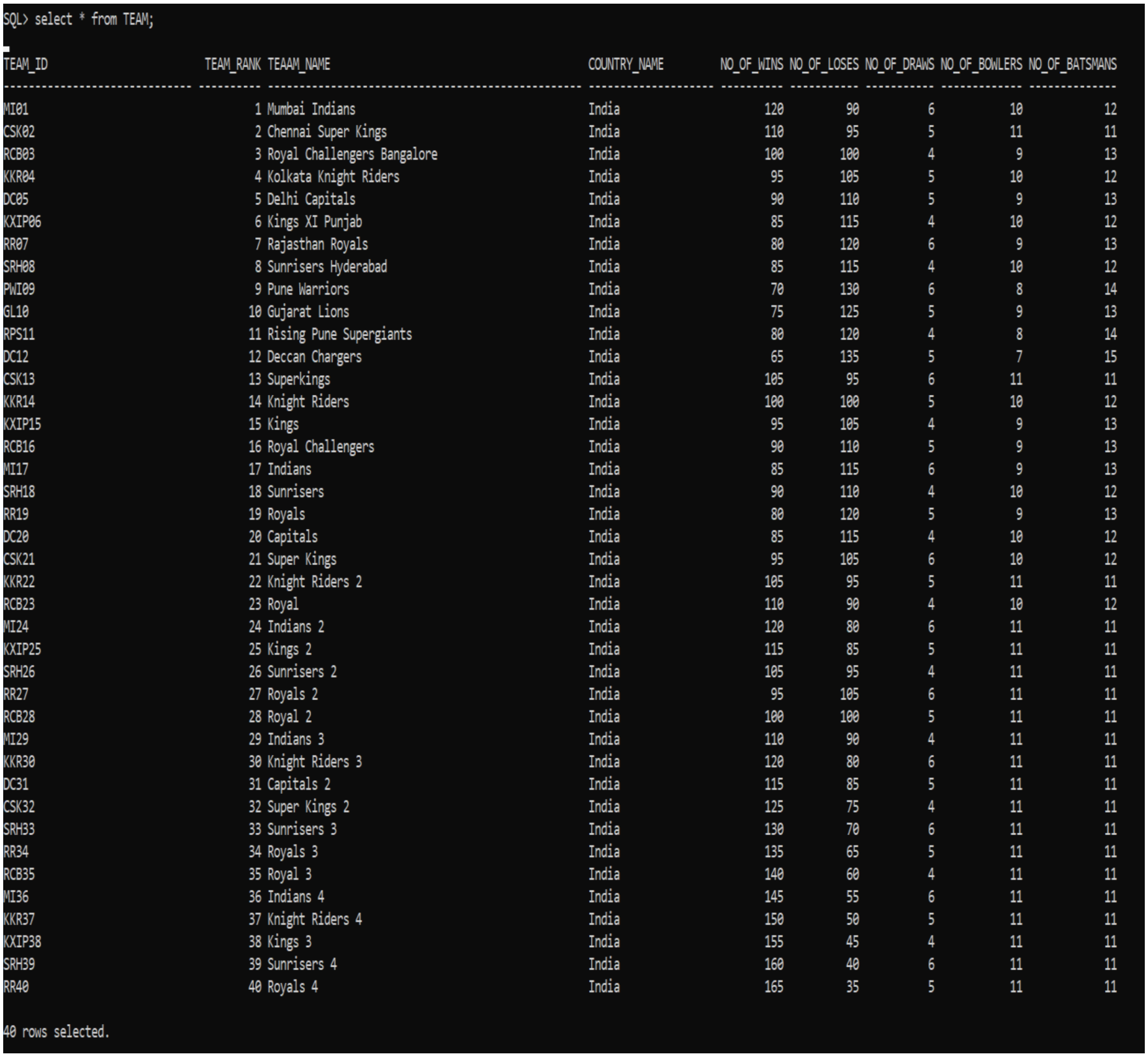
```
SQL> desc UMPIRED_BY;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 MATCH_ID                                           VARCHAR2(20)
 UMPIRE_ID                                          VARCHAR2(30)
```

Figure 6.9.2

6.2 TABLE RECORDS/VALUES

1. TABLE TEAM

40 Teams are entered with distinct team_id along with their team rank, country name, no of wins, no of loses, no of draws, no of bowlers and no of batsman. as shown in fig 6.2.1

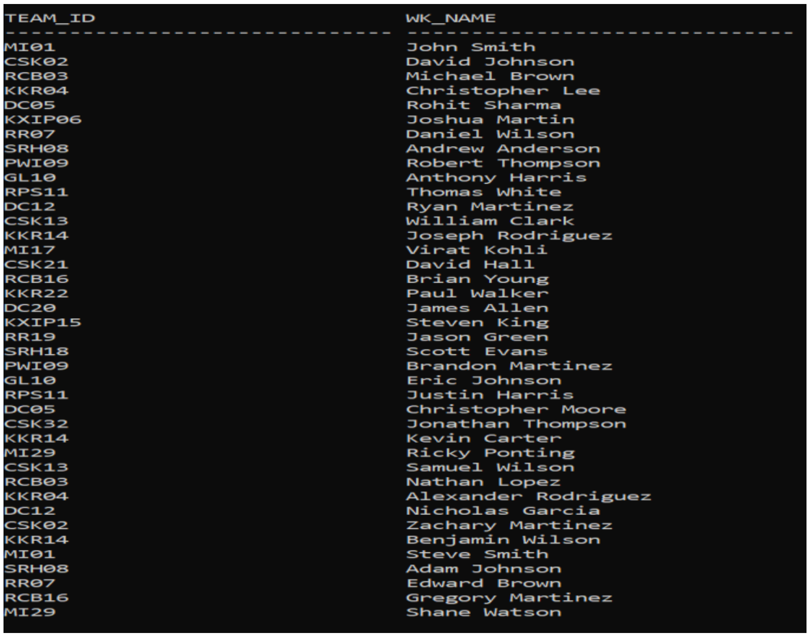


```
SQL> select * from TEAM;

TEAM_ID              TEAM_RANK TEAAM_NAME                               COUNTRY_NAME         NO_OF_WINS NO_OF_LOSES NO_OF_DRAWS NO_OF_BOWLERS NO_OF_BATSMANS
-------------------- --------- ---------------------------------------- -------------------- ---------- ----------- ----------- ------------- --------------
MI01                         1 Mumbai Indians                           India                       120          90           6            10             12
CSK02                        2 Chennai Super Kings                      India                       110          95           5            11             11
RCB03                        3 Royal Challengers Bangalore              India                       100         100           4             9             13
KKR04                        4 Kolkata Knight Riders                    India                        95         105           5            10             12
DC05                         5 Delhi Capitals                           India                        90         110           5             9             13
KXIP06                       6 Kings XI Punjab                          India                        85         115           4            10             12
RR07                         7 Rajasthan Royals                         India                        80         120           6             9             13
SRH08                        8 Sunrisers Hyderabad                      India                        85         115           4            10             12
PWI09                        9 Pune Warriors                            India                        70         130           6             8             14
GL10                        10 Gujarat Lions                            India                        75         125           5             9             13
RPS11                       11 Rising Pune Supergiants                  India                        80         120           4             8             14
DC12                        12 Deccan Chargers                          India                        65         135           5             7             15
CSK13                       13 Superkings                               India                       105          95           6            11             11
KKR14                       14 Knight Riders                            India                       100         100           5            10             12
KXIP15                      15 Kings                                    India                        95         105           4             9             13
RCB16                       16 Royal Challengers                        India                        90         110           5             9             13
MI17                        17 Indians                                  India                        85         115           6             9             13
SRH18                       18 Sunrisers                                India                        90         110           4            10             12
RR19                        19 Royals                                   India                        80         120           5             9             13
DC20                        20 Capitals                                 India                        85         115           4            10             12
CSK21                       21 Super Kings                              India                        95         105           6            10             12
KKR22                       22 Knight Riders 2                          India                       105          95           5            11             11
RCB23                       23 Royal                                    India                       110          90           4            10             12
MI24                        24 Indians 2                                India                       120          80           6            11             11
KXIP25                      25 Kings 2                                  India                       115          85           5            11             11
SRH26                       26 Sunrisers 2                              India                       105          95           4            11             11
RR27                        27 Royals 2                                 India                        95         105           6            11             11
RCB28                       28 Royal 2                                  India                       100         100           5            11             11
MI29                        29 Indians 3                                India                       110          90           4            11             11
KKR30                       30 Knight Riders 3                          India                       120          80           6            11             11
DC31                        31 Capitals 2                               India                       115          85           5            11             11
CSK32                       32 Super Kings 2                            India                       125          75           4            11             11
SRH33                       33 Sunrisers 3                              India                       130          70           6            11             11
RR34                        34 Royals 3                                 India                       135          65           5            11             11
RCB35                       35 Royal 3                                  India                       140          60           4            11             11
MI36                        36 Indians 4                                India                       145          55           6            11             11
KKR37                       37 Knight Riders 4                          India                       150          50           5            11             11
KXIP38                      38 Kings 3                                  India                       155          45           4            11             11
SRH39                       39 Sunrisers 4                              India                       160          40           6            11             11
RR40                        40 Royals 4                                 India                       165          35           5            11             11

40 rows selected.
```

Figure 6.2.1

2. TABLE WICKET_KEEPER

40 Wicket keeper names are added to the table wicket keeper along with their team id. as shown in fig 6.2.2

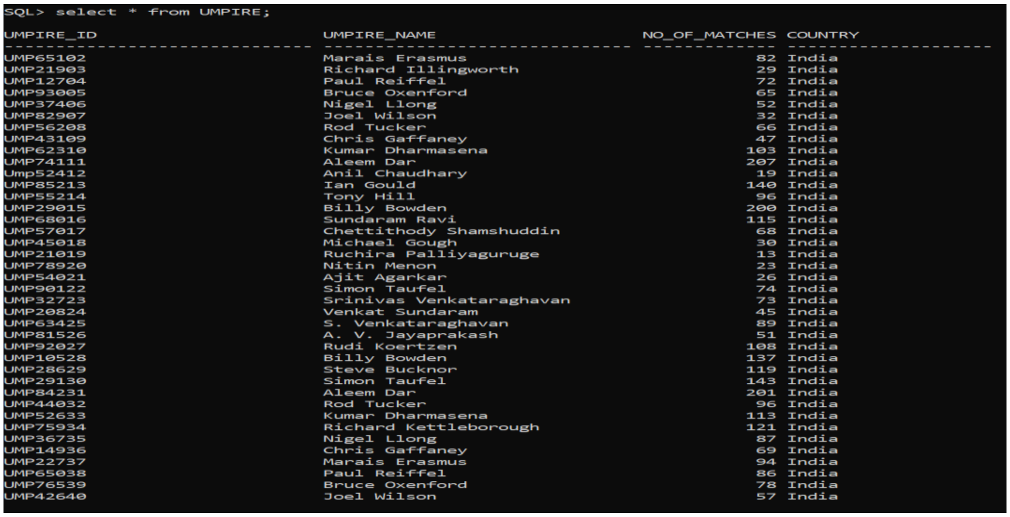


```
TEAM_ID                        WK_NAME
------------------------------ ------------------------------
MI01                           John Smith
CSK02                          David Johnson
RCB03                          Michael Brown
KKR04                          Christopher Lee
DC05                           Rohit Sharma
KXIP06                         Joshua Martin
RR07                           Daniel Wilson
SRH08                          Andrew Anderson
PWI09                          Robert Thompson
GL10                           Anthony Harris
RPS11                          Thomas White
DC12                           Ryan Martinez
CSK13                          William Clark
KKR14                          Joseph Rodriguez
MI17                           Virat Kohli
CSK21                          David Hall
RCB16                          Brian Young
KKR22                          Paul Walker
DC20                           James Allen
KXIP15                         Steven King
RR19                           Jason Green
SRH18                          Scott Evans
PWI09                          Brandon Martinez
GL10                           Eric Johnson
RPS11                          Justin Harris
DC05                           Christopher Moore
CSK32                          Jonathan Thompson
KKR14                          Kevin Carter
MI29                           Ricky Ponting
CSK13                          Samuel Wilson
RCB03                          Nathan Lopez
KKR04                          Alexander Rodriguez
DC12                           Nicholas Garcia
CSK02                          Zachary Martinez
KKR14                          Benjamin Wilson
MI01                           Steve Smith
SRH08                          Adam Johnson
RR07                           Edward Brown
RCB16                          Gregory Martinez
MI29                           Shane Watson
```

Figure 6.2.2

3. TABLE UMPIRE

40 records of distinct umpire_id along with umpire name, no of matches they have umpired to the table umpire as shown in fig 6.2.3

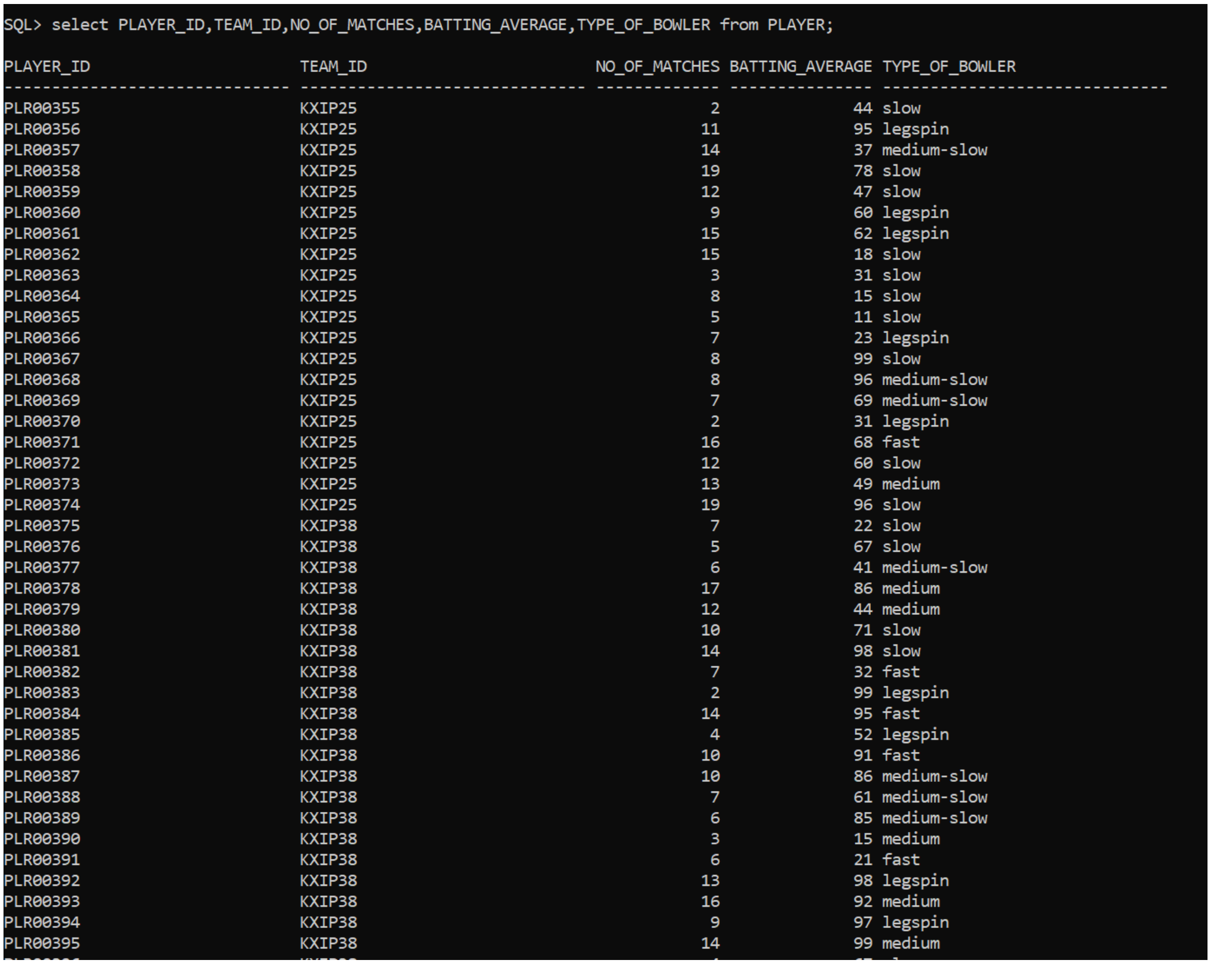


```
SQL> select * from UMPIRE;

UMPIRE_ID                      UMPIRE_NAME                    NO_OF_MATCHES COUNTRY
------------------------------ ------------------------------ ------------- --------------------
UMP65102                       Marais Erasmus                            82 India
UMP21903                       Richard Illingworth                       29 India
UMP12704                       Paul Reiffel                              72 India
UMP93005                       Bruce Oxenford                            65 India
UMP37406                       Nigel Llong                               52 India
UMP82907                       Joel Wilson                               32 India
UMP56208                       Rod Tucker                                66 India
UMP43109                       Chris Gaffaney                            47 India
UMP62310                       Kumar Dharmasena                         103 India
UMP74111                       Aleem Dar                                207 India
Ump52412                       Anil Chaudhary                            19 India
UMP85213                       Ian Gould                                140 India
UMP55214                       Tony Hill                                 96 India
UMP29015                       Billy Bowden                             200 India
UMP68016                       Sundaram Ravi                            115 India
UMP57017                       Chettithody Shamshuddin                   68 India
UMP45018                       Michael Gough                             30 India
UMP21019                       Ruchira Palliyaguruge                     13 India
UMP78920                       Nitin Menon                               23 India
UMP54021                       Ajit Agarkar                              26 India
UMP90122                       Simon Taufel                              74 India
UMP32723                       Srinivas Venkataraghavan                  73 India
UMP20824                       Venkat Sundaram                           45 India
UMP63425                       S. Venkataraghavan                        89 India
UMP81526                       A. V. Jayaprakash                         51 India
UMP92027                       Rudi Koertzen                            108 India
UMP10528                       Billy Bowden                             137 India
UMP28629                       Steve Bucknor                            119 India
UMP29130                       Simon Taufel                             143 India
UMP84231                       Aleem Dar                                201 India
UMP44032                       Rod Tucker                                96 India
UMP52633                       Kumar Dharmasena                         113 India
UMP75934                       Richard Kettleborough                    121 India
UMP36735                       Nigel Llong                               87 India
UMP14936                       Chris Gaffaney                            69 India
UMP22737                       Marais Erasmus                            94 India
UMP65038                       Paul Reiffel                              86 India
UMP76539                       Bruce Oxenford                            78 India
UMP42640                       Joel Wilson                               57 India
```

Figure 6.2.3

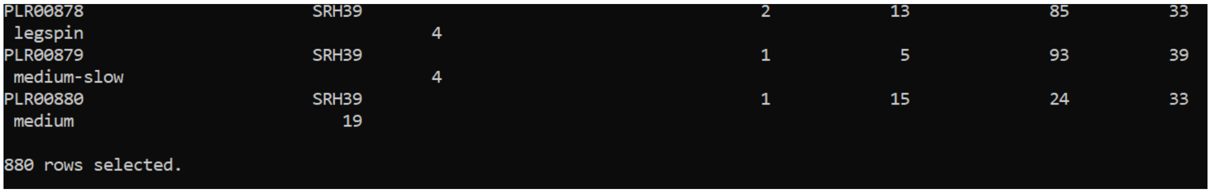
4. TABLE PLAYER

Since we have 40 Teams in out cricket database and each team has 22 players so totally 40*22 thus 880 player records are added to the table player. As shown in fig 6.2.4



```
SQL> select PLAYER_ID,TEAM_ID,NO_OF_MATCHES,BATTING_AVERAGE,TYPE_OF_BOWLER from PLAYER;

PLAYER_ID                      TEAM_ID                        NO_OF_MATCHES BATTING_AVERAGE TYPE_OF_BOWLER
------------------------------ ------------------------------ ------------- --------------- ------------------------------
PLR00355                       KXIP25                                     2              44 slow
PLR00356                       KXIP25                                    11              95 legspin
PLR00357                       KXIP25                                    14              37 medium-slow
PLR00358                       KXIP25                                    19              78 slow
PLR00359                       KXIP25                                    12              47 slow
PLR00360                       KXIP25                                     9              60 legspin
PLR00361                       KXIP25                                    15              62 legspin
PLR00362                       KXIP25                                    15              18 slow
PLR00363                       KXIP25                                     3              31 slow
PLR00364                       KXIP25                                     8              15 slow
PLR00365                       KXIP25                                     5              11 slow
PLR00366                       KXIP25                                     7              23 legspin
PLR00367                       KXIP25                                     8              99 slow
PLR00368                       KXIP25                                     8              96 medium-slow
PLR00369                       KXIP25                                     7              69 medium-slow
PLR00370                       KXIP25                                     2              31 legspin
PLR00371                       KXIP25                                    16              68 fast
PLR00372                       KXIP25                                    12              60 slow
PLR00373                       KXIP25                                    13              49 medium
PLR00374                       KXIP25                                    19              96 slow
PLR00375                       KXIP38                                     7              22 slow
PLR00376                       KXIP38                                     5              67 slow
PLR00377                       KXIP38                                     6              41 medium-slow
PLR00378                       KXIP38                                    17              86 medium
PLR00379                       KXIP38                                    12              44 medium
PLR00380                       KXIP38                                    10              71 slow
PLR00381                       KXIP38                                    14              98 slow
PLR00382                       KXIP38                                     7              32 fast
PLR00383                       KXIP38                                     2              99 legspin
PLR00384                       KXIP38                                    14              95 fast
PLR00385                       KXIP38                                     4              52 legspin
PLR00386                       KXIP38                                    10              91 fast
PLR00387                       KXIP38                                    10              86 medium-slow
PLR00388                       KXIP38                                     7              61 medium-slow
PLR00389                       KXIP38                                     6              85 medium-slow
PLR00390                       KXIP38                                     3              15 medium
PLR00391                       KXIP38                                     6              21 fast
PLR00392                       KXIP38                                    13              98 legspin
PLR00393                       KXIP38                                    16              92 medium
PLR00394                       KXIP38                                     9              97 legspin
PLR00395                       KXIP38                                    14              99 medium
```

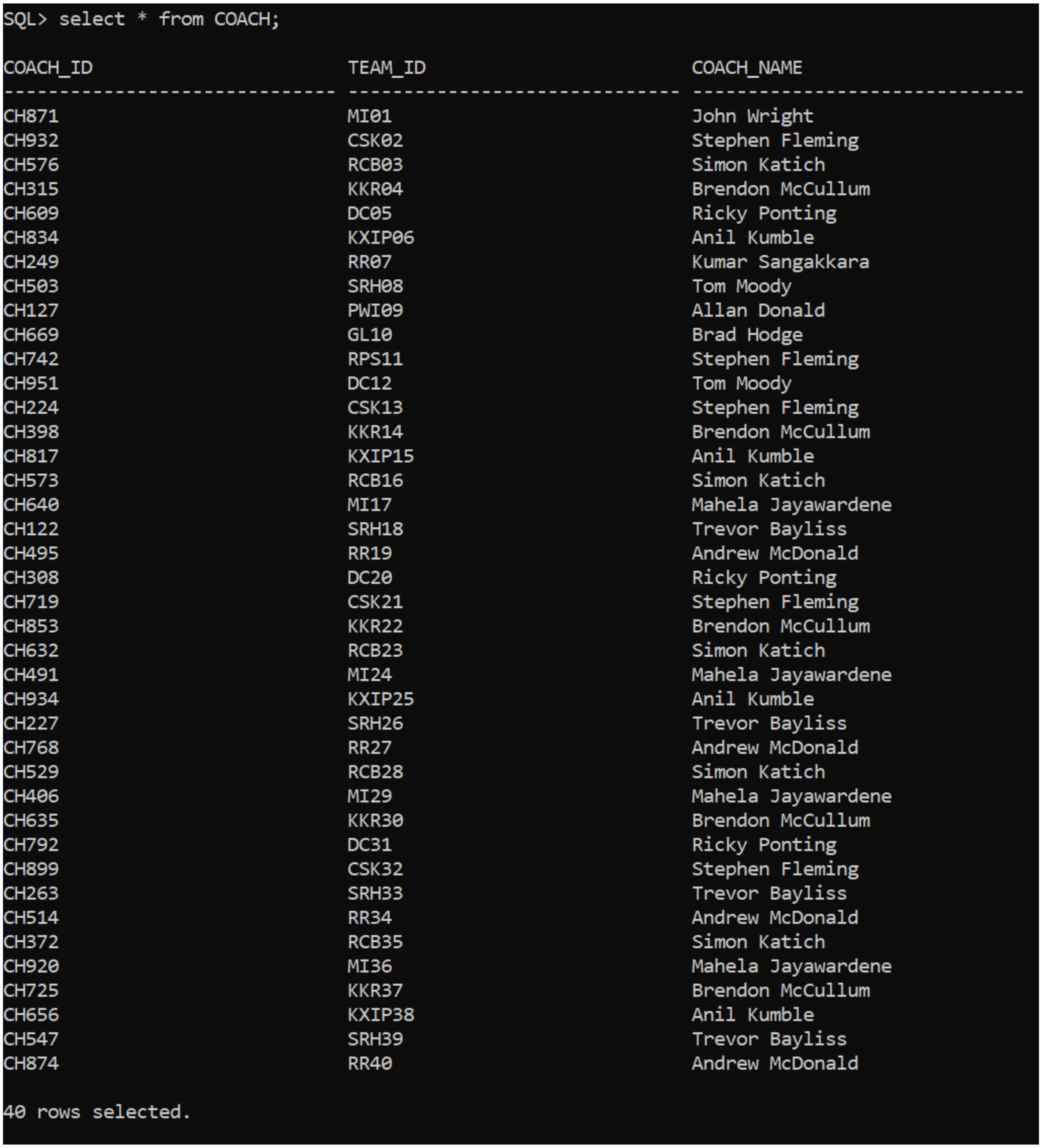
Figure 6.2.4



```
PLR00878                        SRH39                                                    2          13            85          33
 legspin                               4
PLR00879                        SRH39                                                    1           5            93          39
 medium-slow                           4
PLR00880                        SRH39                                                    1          15            24          33
 medium                          19

880 rows selected.
```

5. TABLE COACH

In the table coach 40 records of coaches are added with distinct coach id as shown in fig 6.2.5

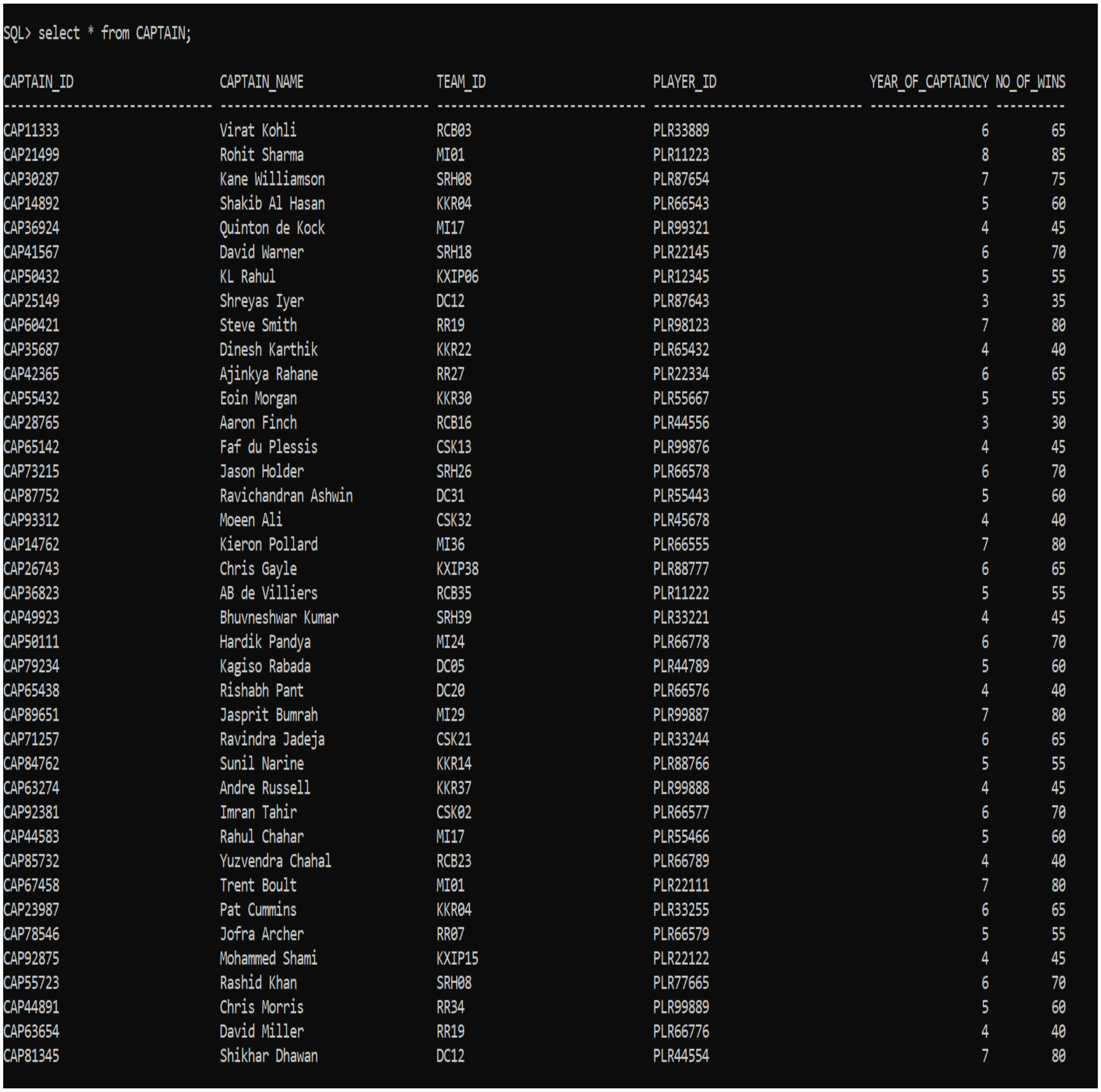


```
SQL> select * from COACH;

COACH_ID                       TEAM_ID                        COACH_NAME
------------------------------ ------------------------------ ------------------------------
CH871                          MI01                           John Wright
CH932                          CSK02                          Stephen Fleming
CH576                          RCB03                          Simon Katich
CH315                          KKR04                          Brendon McCullum
CH609                          DC05                           Ricky Ponting
CH834                          KXIP06                         Anil Kumble
CH249                          RR07                           Kumar Sangakkara
CH503                          SRH08                          Tom Moody
CH127                          PWI09                          Allan Donald
CH669                          GL10                           Brad Hodge
CH742                          RPS11                          Stephen Fleming
CH951                          DC12                           Tom Moody
CH224                          CSK13                          Stephen Fleming
CH398                          KKR14                          Brendon McCullum
CH817                          KXIP15                         Anil Kumble
CH573                          RCB16                          Simon Katich
CH640                          MI17                           Mahela Jayawardene
CH122                          SRH18                          Trevor Bayliss
CH495                          RR19                           Andrew McDonald
CH308                          DC20                           Ricky Ponting
CH719                          CSK21                          Stephen Fleming
CH853                          KKR22                          Brendon McCullum
CH632                          RCB23                          Simon Katich
CH491                          MI24                           Mahela Jayawardene
CH934                          KXIP25                         Anil Kumble
CH227                          SRH26                          Trevor Bayliss
CH768                          RR27                           Andrew McDonald
CH529                          RCB28                          Simon Katich
CH406                          MI29                           Mahela Jayawardene
CH635                          KKR30                          Brendon McCullum
CH792                          DC31                           Ricky Ponting
CH899                          CSK32                          Stephen Fleming
CH263                          SRH33                          Trevor Bayliss
CH514                          RR34                           Andrew McDonald
CH372                          RCB35                          Simon Katich
CH920                          MI36                           Mahela Jayawardene
CH725                          KKR37                          Brendon McCullum
CH656                          KXIP38                         Anil Kumble
CH547                          SRH39                          Trevor Bayliss
CH874                          RR40                           Andrew McDonald

40 rows selected.
```

Figure 6.2.5

6. TABLE CAPTAIN

40 entries with distinct captain id are added along with team id which is used to map with team table and player id which is used to map with player table. As showm in fig 6.2.6

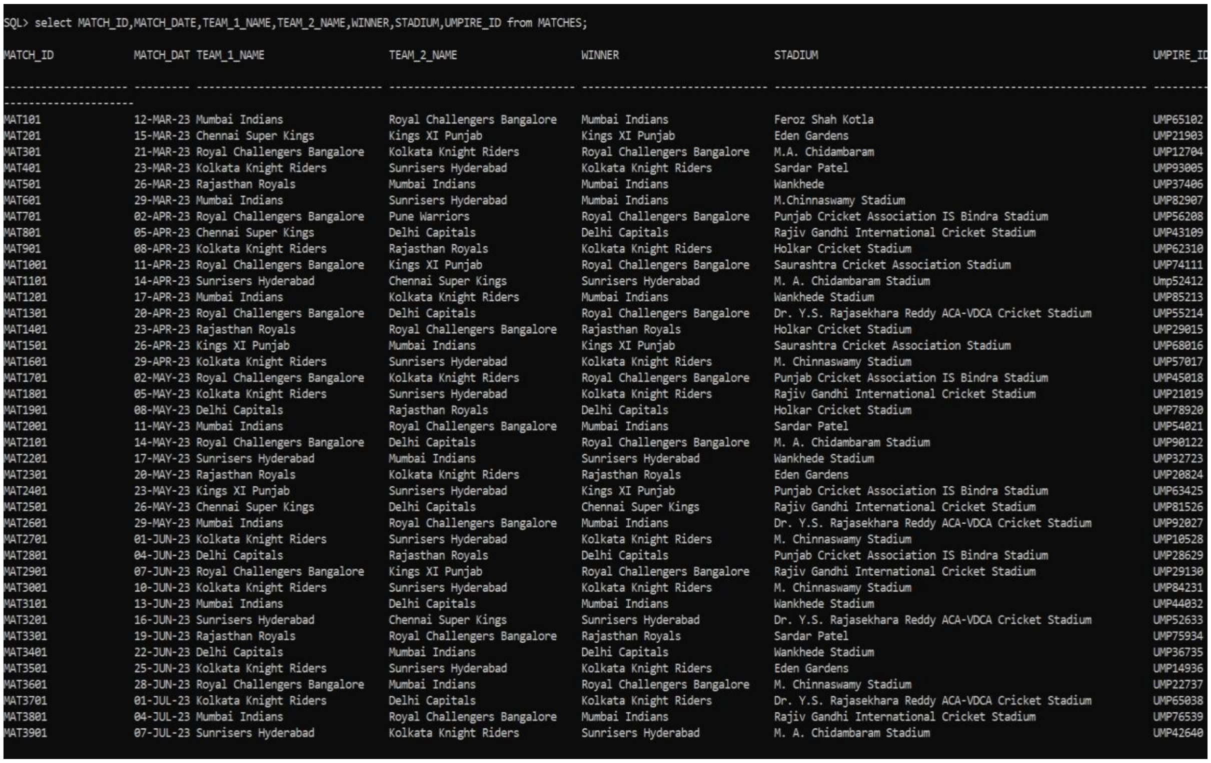


```
SQL> select * from CAPTAIN;

CAPTAIN_ID                   CAPTAIN_NAME                 TEAM_ID                      PLAYER_ID                    YEAR_OF_CAPTAINCY NO_OF_WINS
---------------------------- ---------------------------- ---------------------------- ---------------------------- ----------------- ----------
CAP11333                     Virat Kohli                  RCB03                        PLR33889                                     6         65
CAP21499                     Rohit Sharma                 MI01                         PLR11223                                     8         85
CAP30287                     Kane Williamson              SRH08                        PLR87654                                     7         75
CAP14892                     Shakib Al Hasan              KKR04                        PLR66543                                     5         60
CAP36924                     Quinton de Kock              MI17                         PLR99321                                     4         45
CAP41567                     David Warner                 SRH18                        PLR22145                                     6         70
CAP50432                     KL Rahul                     KXIP06                       PLR12345                                     5         55
CAP25149                     Shreyas Iyer                 DC12                         PLR87643                                     3         35
CAP60421                     Steve Smith                  RR19                         PLR98123                                     7         80
CAP35687                     Dinesh Karthik               KKR22                        PLR65432                                     4         40
CAP42365                     Ajinkya Rahane               RR27                         PLR22334                                     6         65
CAP55432                     Eoin Morgan                  KKR30                        PLR55667                                     5         55
CAP28765                     Aaron Finch                  RCB16                        PLR44556                                     3         30
CAP65142                     Faf du Plessis               CSK13                        PLR99876                                     4         45
CAP73215                     Jason Holder                 SRH26                        PLR66578                                     6         70
CAP87752                     Ravichandran Ashwin          DC31                         PLR55443                                     5         60
CAP93312                     Moeen Ali                    CSK32                        PLR45678                                     4         40
CAP14762                     Kieron Pollard               MI36                         PLR66555                                     7         80
CAP26743                     Chris Gayle                  KXIP38                       PLR88777                                     6         65
CAP36823                     AB de Villiers               RCB35                        PLR11222                                     5         55
CAP49923                     Bhuvneshwar Kumar            SRH39                        PLR33221                                     4         45
CAP50111                     Hardik Pandya                MI24                         PLR66778                                     6         70
CAP79234                     Kagiso Rabada                DC05                         PLR44789                                     5         60
CAP65438                     Rishabh Pant                 DC20                         PLR66576                                     4         40
CAP89651                     Jasprit Bumrah               MI29                         PLR99887                                     7         80
CAP71257                     Ravindra Jadeja              CSK21                        PLR33244                                     6         65
CAP84762                     Sunil Narine                 KKR14                        PLR88766                                     5         55
CAP63274                     Andre Russell                KKR37                        PLR99888                                     4         45
CAP92381                     Imran Tahir                  CSK02                        PLR66577                                     6         70
CAP44583                     Rahul Chahar                 MI17                         PLR55466                                     5         60
CAP85732                     Yuzvendra Chahal             RCB23                        PLR66789                                     4         40
CAP67458                     Trent Boult                  MI01                         PLR22111                                     7         80
CAP23987                     Pat Cummins                  KKR04                        PLR33255                                     6         65
CAP78546                     Jofra Archer                 RR07                         PLR66579                                     5         55
CAP92875                     Mohammed Shami               KXIP15                       PLR22122                                     4         45
CAP55723                     Rashid Khan                  SRH08                        PLR77665                                     6         70
CAP44891                     Chris Morris                 RR34                         PLR99889                                     5         60
CAP63654                     David Miller                 RR19                         PLR66776                                     4         40
CAP81345                     Shikhar Dhawan               DC12                         PLR44554                                     7         80
```

Figure 6.2.6

7. TABLE MATCHES

Here match id is added with unique entries and match date entries are added with date datatype using TO_DATE('12-03-2023', 'DD-MM-YYYY') and match time using TO_TIMESTAMP('15:30', 'HH24:MI'). as shown in fig 6.2.7

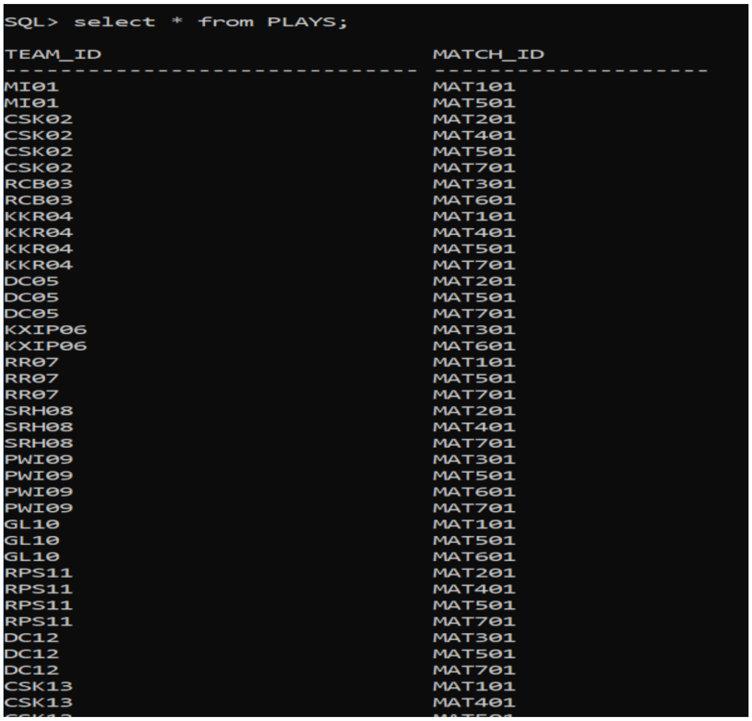


```
SQL> select MATCH_ID,MATCH_DATE,TEAM_1_NAME,TEAM_2_NAME,WINNER,STADIUM,UMPIRE_ID from MATCHES;

MATCH_ID             MATCH_DAT TEAM_1_NAME                    TEAM_2_NAME                    WINNER                         STADIUM                                                      UMPIRE_ID

-------------------- --------- ------------------------------ ------------------------------ ------------------------------ ------------------------------------------------------------ --------
--------------------
MAT101               12-MAR-23 Mumbai Indians                 Royal Challengers Bangalore    Mumbai Indians                 Feroz Shah Kotla                                             UMP65102
MAT201               15-MAR-23 Chennai Super Kings            Kings XI Punjab                Kings XI Punjab                Eden Gardens                                                 UMP21903
MAT301               21-MAR-23 Royal Challengers Bangalore    Kolkata Knight Riders          Royal Challengers Bangalore    M.A. Chidambaram                                             UMP12704
MAT401               23-MAR-23 Kolkata Knight Riders          Sunrisers Hyderabad            Kolkata Knight Riders          Sardar Patel                                                 UMP93005
MAT501               26-MAR-23 Rajasthan Royals               Mumbai Indians                 Mumbai Indians                 Wankhede                                                     UMP37406
MAT601               29-MAR-23 Mumbai Indians                 Sunrisers Hyderabad            Mumbai Indians                 M.Chinnaswamy Stadium                                        UMP82907
MAT701               02-APR-23 Royal Challengers Bangalore    Pune Warriors                  Royal Challengers Bangalore    Punjab Cricket Association IS Bindra Stadium                 UMP56208
MAT801               05-APR-23 Chennai Super Kings            Delhi Capitals                 Delhi Capitals                 Rajiv Gandhi International Cricket Stadium                   UMP43109
MAT901               08-APR-23 Kolkata Knight Riders          Rajasthan Royals               Kolkata Knight Riders          Holkar Cricket Stadium                                       UMP62310
MAT1001              11-APR-23 Royal Challengers Bangalore    Kings XI Punjab                Royal Challengers Bangalore    Saurashtra Cricket Association Stadium                       UMP74111
MAT1101              14-APR-23 Sunrisers Hyderabad            Chennai Super Kings            Sunrisers Hyderabad            M. A. Chidambaram Stadium                                    Ump52412
MAT1201              17-APR-23 Mumbai Indians                 Kolkata Knight Riders          Mumbai Indians                 Wankhede Stadium                                             UMP85213
MAT1301              20-APR-23 Royal Challengers Bangalore    Delhi Capitals                 Royal Challengers Bangalore    Dr. Y.S. Rajasekhara Reddy ACA-VDCA Cricket Stadium          UMP55214
MAT1401              23-APR-23 Rajasthan Royals               Royal Challengers Bangalore    Rajasthan Royals               Holkar Cricket Stadium                                       UMP29015
MAT1501              26-APR-23 Kings XI Punjab                Mumbai Indians                 Kings XI Punjab                Saurashtra Cricket Association Stadium                       UMP68016
MAT1601              29-APR-23 Kolkata Knight Riders          Sunrisers Hyderabad            Kolkata Knight Riders          M. Chinnaswamy Stadium                                       UMP57017
MAT1701              02-MAY-23 Royal Challengers Bangalore    Kolkata Knight Riders          Royal Challengers Bangalore    Punjab Cricket Association IS Bindra Stadium                 UMP45018
MAT1801              05-MAY-23 Kolkata Knight Riders          Sunrisers Hyderabad            Kolkata Knight Riders          Rajiv Gandhi International Cricket Stadium                   UMP21019
MAT1901              08-MAY-23 Delhi Capitals                 Rajasthan Royals               Delhi Capitals                 Holkar Cricket Stadium                                       UMP78920
MAT2001              11-MAY-23 Mumbai Indians                 Royal Challengers Bangalore    Mumbai Indians                 Sardar Patel                                                 UMP54021
MAT2101              14-MAY-23 Royal Challengers Bangalore    Delhi Capitals                 Royal Challengers Bangalore    M. A. Chidambaram Stadium                                    UMP90122
MAT2201              17-MAY-23 Sunrisers Hyderabad            Mumbai Indians                 Sunrisers Hyderabad            Wankhede Stadium                                             UMP32723
MAT2301              20-MAY-23 Rajasthan Royals               Kolkata Knight Riders          Rajasthan Royals               Eden Gardens                                                 UMP20824
MAT2401              23-MAY-23 Kings XI Punjab                Sunrisers Hyderabad            Kings XI Punjab                Punjab Cricket Association IS Bindra Stadium                 UMP63425
MAT2501              26-MAY-23 Chennai Super Kings            Delhi Capitals                 Chennai Super Kings            Rajiv Gandhi International Cricket Stadium                   UMP81526
MAT2601              29-MAY-23 Mumbai Indians                 Royal Challengers Bangalore    Mumbai Indians                 Dr. Y.S. Rajasekhara Reddy ACA-VDCA Cricket Stadium          UMP92027
MAT2701              01-JUN-23 Kolkata Knight Riders          Sunrisers Hyderabad            Kolkata Knight Riders          M. Chinnaswamy Stadium                                       UMP10528
MAT2801              04-JUN-23 Delhi Capitals                 Rajasthan Royals               Delhi Capitals                 Punjab Cricket Association IS Bindra Stadium                 UMP28629
MAT2901              07-JUN-23 Royal Challengers Bangalore    Kings XI Punjab                Royal Challengers Bangalore    Rajiv Gandhi International Cricket Stadium                   UMP29130
MAT3001              10-JUN-23 Kolkata Knight Riders          Sunrisers Hyderabad            Kolkata Knight Riders          M. Chinnaswamy Stadium                                       UMP84231
MAT3101              13-JUN-23 Mumbai Indians                 Delhi Capitals                 Mumbai Indians                 Wankhede Stadium                                             UMP44032
MAT3201              16-JUN-23 Sunrisers Hyderabad            Chennai Super Kings            Sunrisers Hyderabad            Dr. Y.S. Rajasekhara Reddy ACA-VDCA Cricket Stadium          UMP52633
MAT3301              19-JUN-23 Rajasthan Royals               Royal Challengers Bangalore    Rajasthan Royals               Sardar Patel                                                 UMP75934
MAT3401              22-JUN-23 Delhi Capitals                 Mumbai Indians                 Delhi Capitals                 Wankhede Stadium                                             UMP36735
MAT3501              25-JUN-23 Kolkata Knight Riders          Sunrisers Hyderabad            Kolkata Knight Riders          Eden Gardens                                                 UMP14936
MAT3601              28-JUN-23 Royal Challengers Bangalore    Mumbai Indians                 Royal Challengers Bangalore    M. Chinnaswamy Stadium                                       UMP22737
MAT3701              01-JUL-23 Kolkata Knight Riders          Delhi Capitals                 Kolkata Knight Riders          Dr. Y.S. Rajasekhara Reddy ACA-VDCA Cricket Stadium          UMP65038
MAT3801              04-JUL-23 Mumbai Indians                 Royal Challengers Bangalore    Mumbai Indians                 Rajiv Gandhi International Cricket Stadium                   UMP76539
MAT3901              07-JUL-23 Sunrisers Hyderabad            Kolkata Knight Riders          Sunrisers Hyderabad            M. A. Chidambaram Stadium                                    UMP42640
```

Figure 6.2.7

8. TABLE PLAYS

Each team plays more than one match so the team id cannot be unique and for an match two team are needed here match id also cannot be unique as shown in fig 6.2.8

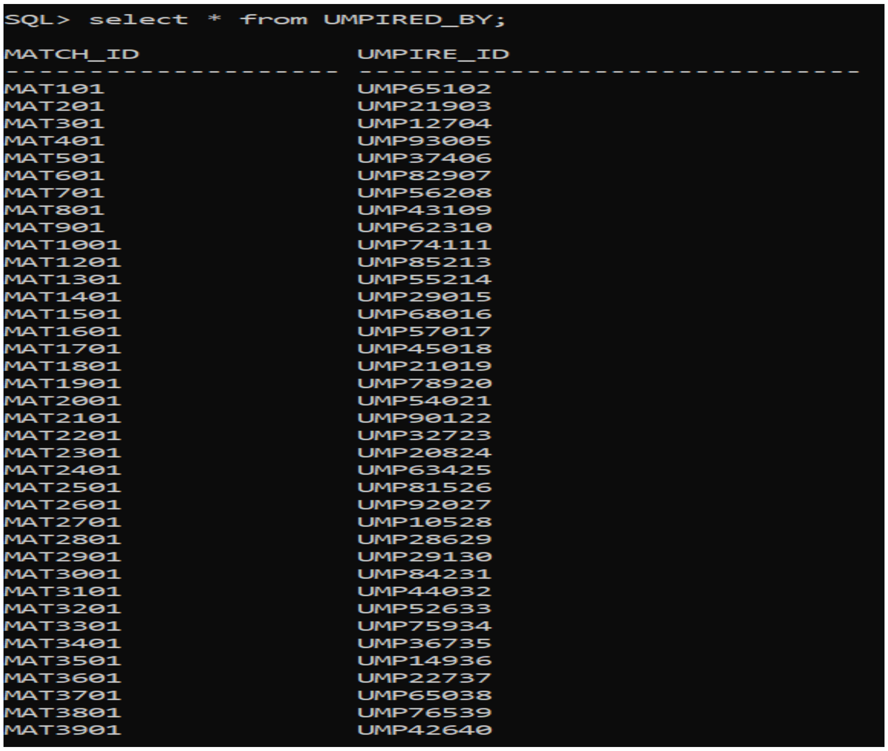


```
SQL> select * from PLAYS;

TEAM_ID                        MATCH_ID
------------------------------ --------------------
MI01                           MAT101
MI01                           MAT501
CSK02                          MAT201
CSK02                          MAT401
CSK02                          MAT501
CSK02                          MAT701
RCB03                          MAT301
RCB03                          MAT601
KKR04                          MAT101
KKR04                          MAT401
KKR04                          MAT501
KKR04                          MAT701
DC05                           MAT201
DC05                           MAT501
DC05                           MAT701
KXIP06                         MAT301
KXIP06                         MAT601
RR07                           MAT101
RR07                           MAT501
RR07                           MAT701
SRH08                          MAT201
SRH08                          MAT401
SRH08                          MAT701
PWI09                          MAT301
PWI09                          MAT501
PWI09                          MAT601
PWI09                          MAT701
GL10                           MAT101
GL10                           MAT501
GL10                           MAT601
RPS11                          MAT201
RPS11                          MAT401
RPS11                          MAT501
RPS11                          MAT701
DC12                           MAT301
DC12                           MAT501
DC12                           MAT701
CSK13                          MAT101
CSK13                          MAT401
CSK13                          MAT501
```

Figure 6.2.8

9. TABLE UMPIRED_BY

Each match is umpired by an umpire so the 40 entries of match id and umpire id are add to the table umpire as shown in fig 6.2.9



```
SQL> select * from UMPIRED_BY;

MATCH_ID             UMPIRE_ID
-------------------- ------------------------------
MAT101               UMP65102
MAT201               UMP21903
MAT301               UMP12704
MAT401               UMP93005
MAT501               UMP37406
MAT601               UMP82907
MAT701               UMP56208
MAT801               UMP43109
MAT901               UMP62310
MAT1001              UMP74111
MAT1201              UMP85213
MAT1301              UMP55214
MAT1401              UMP29015
MAT1501              UMP68016
MAT1601              UMP57017
MAT1701              UMP45018
MAT1801              UMP21019
MAT1901              UMP78920
MAT2001              UMP54021
MAT2101              UMP90122
MAT2201              UMP32723
MAT2301              UMP20824
MAT2401              UMP63425
MAT2501              UMP81526
MAT2601              UMP92027
MAT2701              UMP10528
MAT2801              UMP28629
MAT2901              UMP29130
MAT3001              UMP84231
MAT3101              UMP44032
MAT3201              UMP52633
MAT3301              UMP75934
MAT3401              UMP36735
MAT3501              UMP14936
MAT3601              UMP22737
MAT3701              UMP65038
MAT3801              UMP76539
MAT3901              UMP42640
```

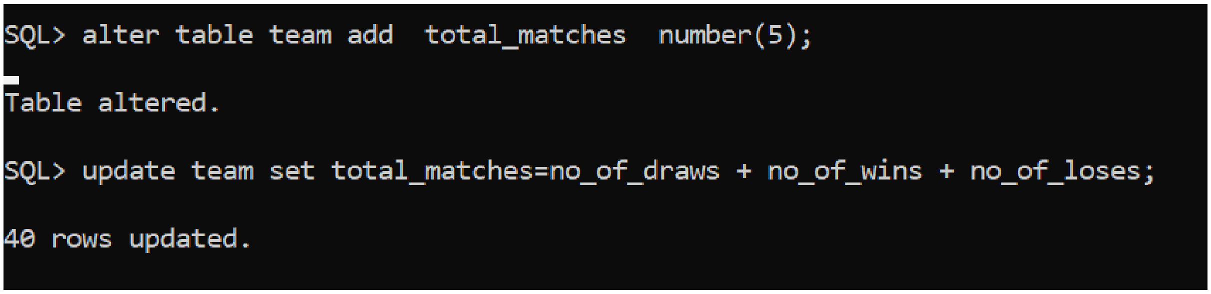
Figure 6.2.9

CHAPTER 7

SQL QUERIES USING UPDATE/JOIN/NESTING/SET OPERATIONS

1. USING UPDATE COMMAND

Give an SQL query to add an column TOTAL_NO_OF_MATCHES to the table team and update the rows using total matches= number of WINS+ number of LOSES + number of DRAWS. As shown in fig 7.1



```
SQL> alter table team add  total_matches  number(5);

Table altered.

SQL> update team set total_matches=no_of_draws + no_of_wins + no_of_loses;

40 rows updated.
```

Figure 7.1

2. USING EMBEDDED/NESTING SELECT

Write an SQL query to display the UMPIRE NAMES who has umpired the matches in the month of MARCH ?

QUERY: select UMPIRE_NAME from UMPIRE where UMPIRE_ID in (select UMPIRE_ID from MATCHES where MATCH_DATE like '%MAR%');

Subquery Explanation:

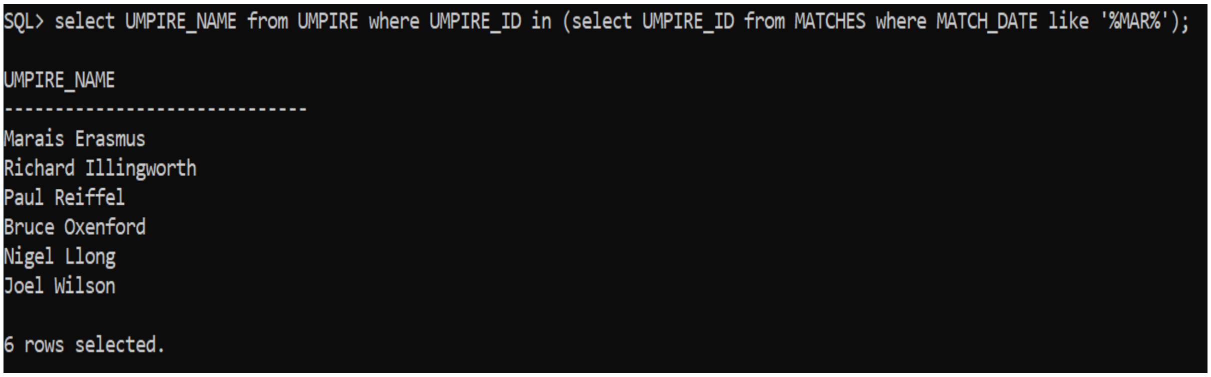
a. SELECT UMPIRE_ID FROM MATCHES WHERE MATCH_DATE LIKE '%MAR%': This subquery selects the UMPIRE_ID values from the MATCHES table where the MATCH_DATE column contains the substring 'MAR', indicating matches that occurred in March.

Main Query:

b. SELECT UMPIRE_NAME FROM UMPIRE WHERE UMPIRE_ID IN (...): This main query selects the UMPIRE_NAME from the UMPIRE table.
c. The IN clause is used to check if the UMPIRE_ID from the UMPIRE table exists in the result set obtained from the subquery.

Result:

d. The query returns the UMPIRE_NAMEs corresponding to the UMPIRE_IDs retrieved from the subquery.
e. This provides a list of umpire names who officiated matches that occurred in March. As shown in fig 7.2



```
SQL> select UMPIRE_NAME from UMPIRE where UMPIRE_ID in (select UMPIRE_ID from MATCHES where MATCH_DATE like '%MAR%');

UMPIRE_NAME
------------------------------
Marais Erasmus
Richard Illingworth
Paul Reiffel
Bruce Oxenford
Nigel Llong
Joel Wilson

6 rows selected.
```

Figure 7.2

3. SELECT USING INNER JOIN

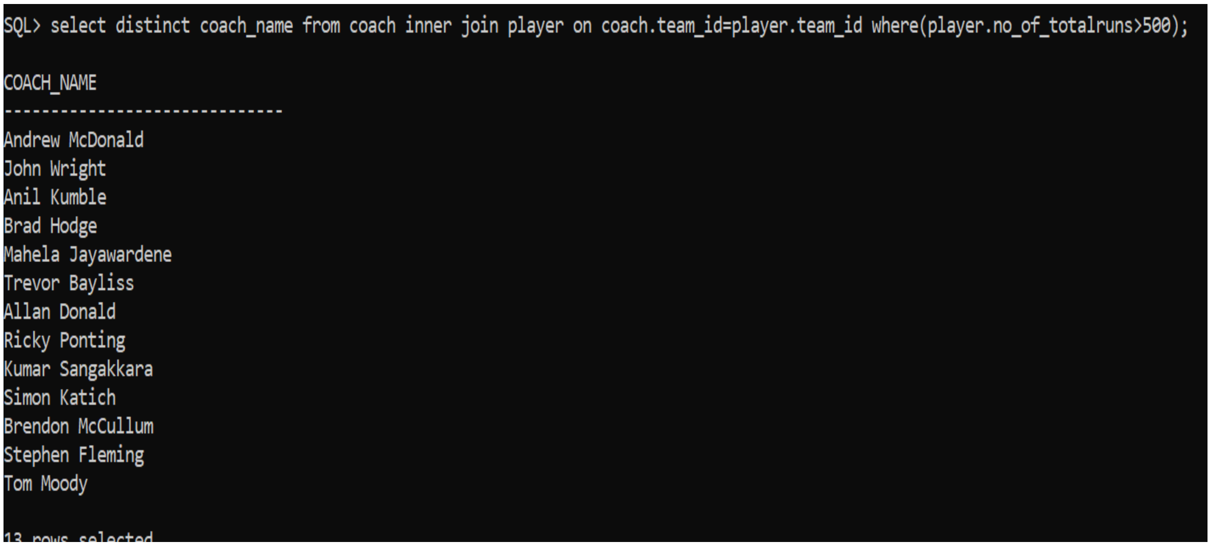
Write an SQL query to display name of coach who has coached a player with total_runs greater than 500;

QUERY: select distinct coach_name from coach inner join player on coach.team_id=player.team_id where(player.no_of_totalruns>500);

- SELECT DISTINCT coach_name: This part of the main query specifies that you want to select unique coach names (coach_name).
- FROM coach: Indicates that you are selecting data from the coach table.
- INNER JOIN player ON coach.team_id = player.team_id: This is the join condition that connects the coach table with the player table based on the team_id column. It ensures that only rows with matching team_id values from both tables are included in the result set.
- WHERE player.no_of_totalruns > 500: This filter condition is applied to the joined data. It specifies that you only want rows where the no_of_totalruns column in the player table is greater than 500.

Result Explanation:

The query will return a list of distinct coach names (coach_name) who are associated with teams where at least one player has scored more than 500 total runs. As shown in fig 7.3



```
SQL> select distinct coach_name from coach inner join player on coach.team_id=player.team_id where(player.no_of_totalruns>500);

COACH_NAME
----------------------------
Andrew McDonald
John Wright
Anil Kumble
Brad Hodge
Mahela Jayawardene
Trevor Bayliss
Allan Donald
Ricky Ponting
Kumar Sangakkara
Simon Katich
Brendon McCullum
Stephen Fleming
Tom Moody

13 rows selected.
```

Figure 7.3

4. SELECT USING JOINING THE COMMON ATTRIBUTE

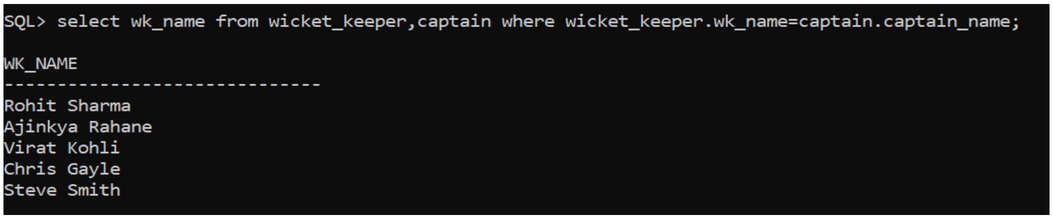
Write an SQL query to Display name of wicket keeper who is also the captain of his team

QUERY: select wk_name from wicket_keeper,captain where wicket_keeper.wk_name=captain.captain_name;

- SELECT wk_name: Specifies that we want to retrieve the wk_name column from the result set.
- FROM wicket_keeper, captain: Specifies the tables from which we are retrieving data, using a comma to indicate a Cartesian product (cross join) between the two tables. This means every row from wicket_keeper is paired with every row from captain.
- WHERE wicket_keeper.wk_name = captain.captain_name: Adds a condition to the cross join. It filters the rows where the wk_name in wicket_keeper is equal to captain_name in captain, effectively joining the two tables based on this condition.

Result:

- The result of this query will be the list of wk_name values where a wicket keeper is also a team captain, based on the matching names between wicket_keeper and captain as shown in fig 7.4



```
SQL> select wk_name from wicket_keeper,captain where wicket_keeper.wk_name=captain.captain_name;

WK_NAME
------------------------------
Rohit Sharma
Ajinkya Rahane
Virat Kohli
Chris Gayle
Steve Smith
```

Figure 7.4

CHAPTER 8

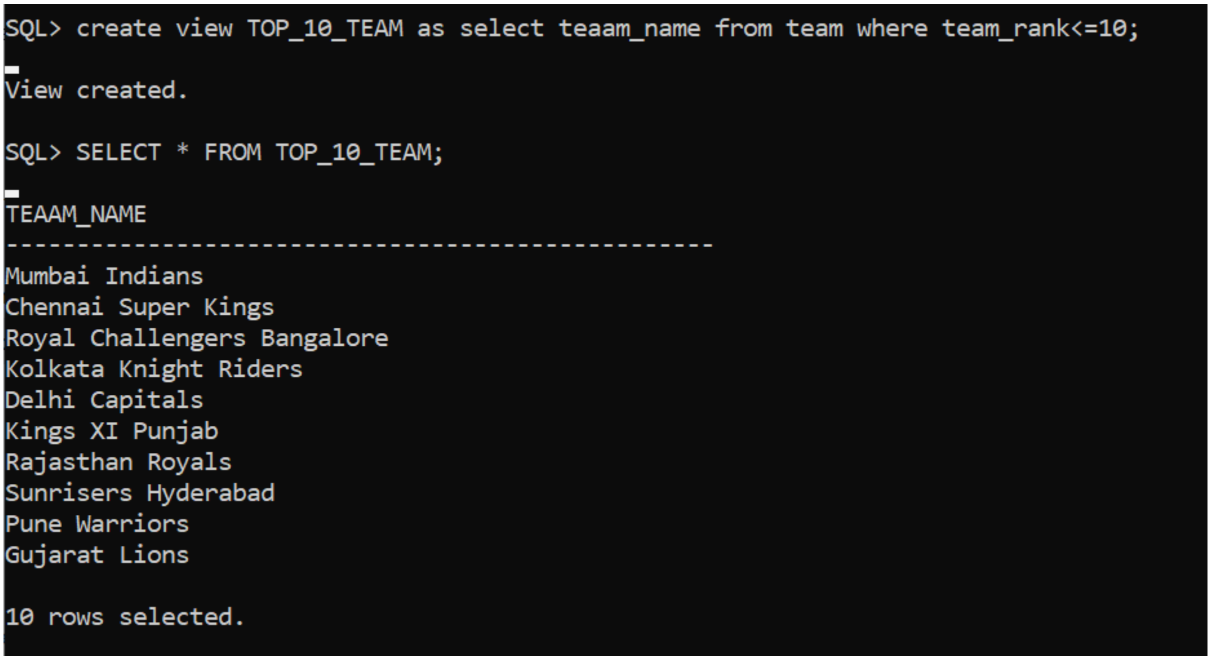
Creating Views

What are Views?

views are virtual tables that represent the result of a stored query. They are not stored as a part of the database schema but are dynamically generated when they are queried. Views can be used to simplify complex queries, provide a layer of security by restricting access to specific columns or rows of a table, and present a customized perspective of the data for different users or applications. They help in separating the logical and physical layers of the database, enhancing data abstraction and organization.

View 1

We give an PRESS report about the top ten team of the series we create an view as shown in fig 8.1

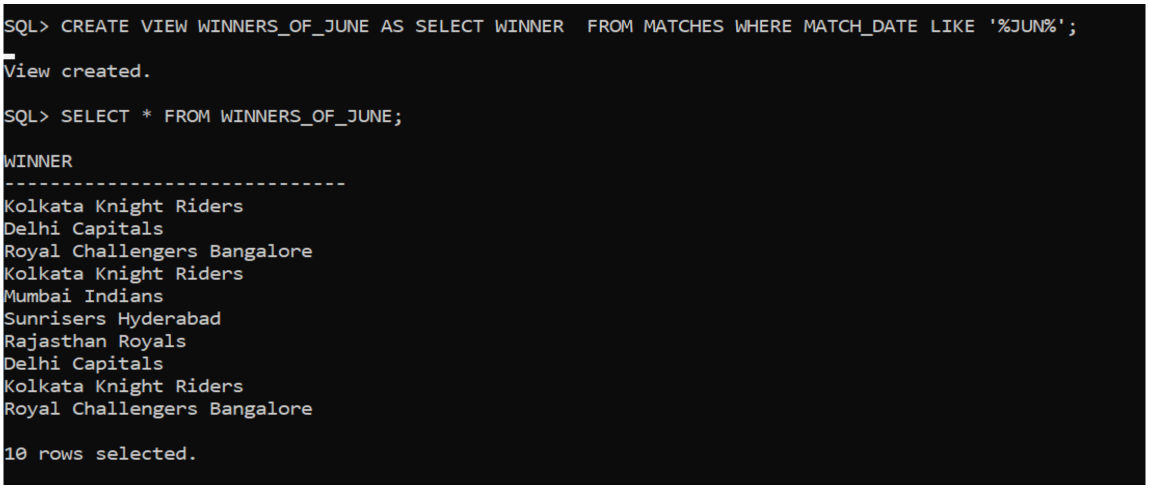


```
SQL> create view TOP_10_TEAM as select teaam_name from team where team_rank<=10;

View created.

SQL> SELECT * FROM TOP_10_TEAM;

TEAAM_NAME
--------------------------------------------------
Mumbai Indians
Chennai Super Kings
Royal Challengers Bangalore
Kolkata Knight Riders
Delhi Capitals
Kings XI Punjab
Rajasthan Royals
Sunrisers Hyderabad
Pune Warriors
Gujarat Lions

10 rows selected.
```

Figure 8.1

View 2

Winners for the month of JUNE as shown in fig 8.2



```
SQL> CREATE VIEW WINNERS_OF_JUNE AS SELECT WINNER  FROM MATCHES WHERE MATCH_DATE LIKE '%JUN%';

View created.

SQL> SELECT * FROM WINNERS_OF_JUNE;

WINNER
------------------------------
Kolkata Knight Riders
Delhi Capitals
Royal Challengers Bangalore
Kolkata Knight Riders
Mumbai Indians
Sunrisers Hyderabad
Rajasthan Royals
Delhi Capitals
Kolkata Knight Riders
Royal Challengers Bangalore

10 rows selected.
```

Figure 8.2

CHAPTER 9

WORKING WITH PL/SQL

What is PL/SQL?

PL/SQL (Procedural Language/Structured Query Language) is Oracle's extension to SQL that allows developers to write procedural code within the database, enabling tasks such as control flow, loops, exception handling, and the creation of stored procedures and functions. It provides tight integration with SQL for efficient data manipulation and is commonly used for developing database-centric applications on Oracle platforms.

1. PL/SQL Code to add records to the table player.

Declare Variables:

- i INT := 0: Initialize a counter for player IDs.
- team_id VARCHAR2(30);: Variable to hold each team ID fetched from the team table.
- team_cursor SYS_REFCURSOR;: Declare a cursor variable to fetch team IDs from the team table.

Open Cursor:

- OPEN team_cursor FOR SELECT TEAM_ID FROM team;: Open a cursor to fetch all TEAM_ID values from the team table.

Loop through Teams:

- LOOP: Start an infinite loop to iterate through team IDs.
- FETCH team_cursor INTO team_id;: Fetch the next TEAM_ID from the cursor into the team_id variable.
- EXIT WHEN team_cursor%NOTFOUND;: Exit the loop when there are no more rows to fetch from the cursor.

Generate Player Data:

- Nested Loop (FOR j IN 1..22 LOOP): This loop generates 22 random player entries for each team.
- Inside the loop, i is incremented to generate unique player IDs using PLR followed by a padded number.
- Random values are generated for various player attributes such as player type, age, runs, wickets, etc., using DBMS_RANDOM.VALUE function.

Insert Data into PLAYER Table:

- INSERT INTO PLAYER ...: Inserts the randomly generated player data into the PLAYER table for each team.

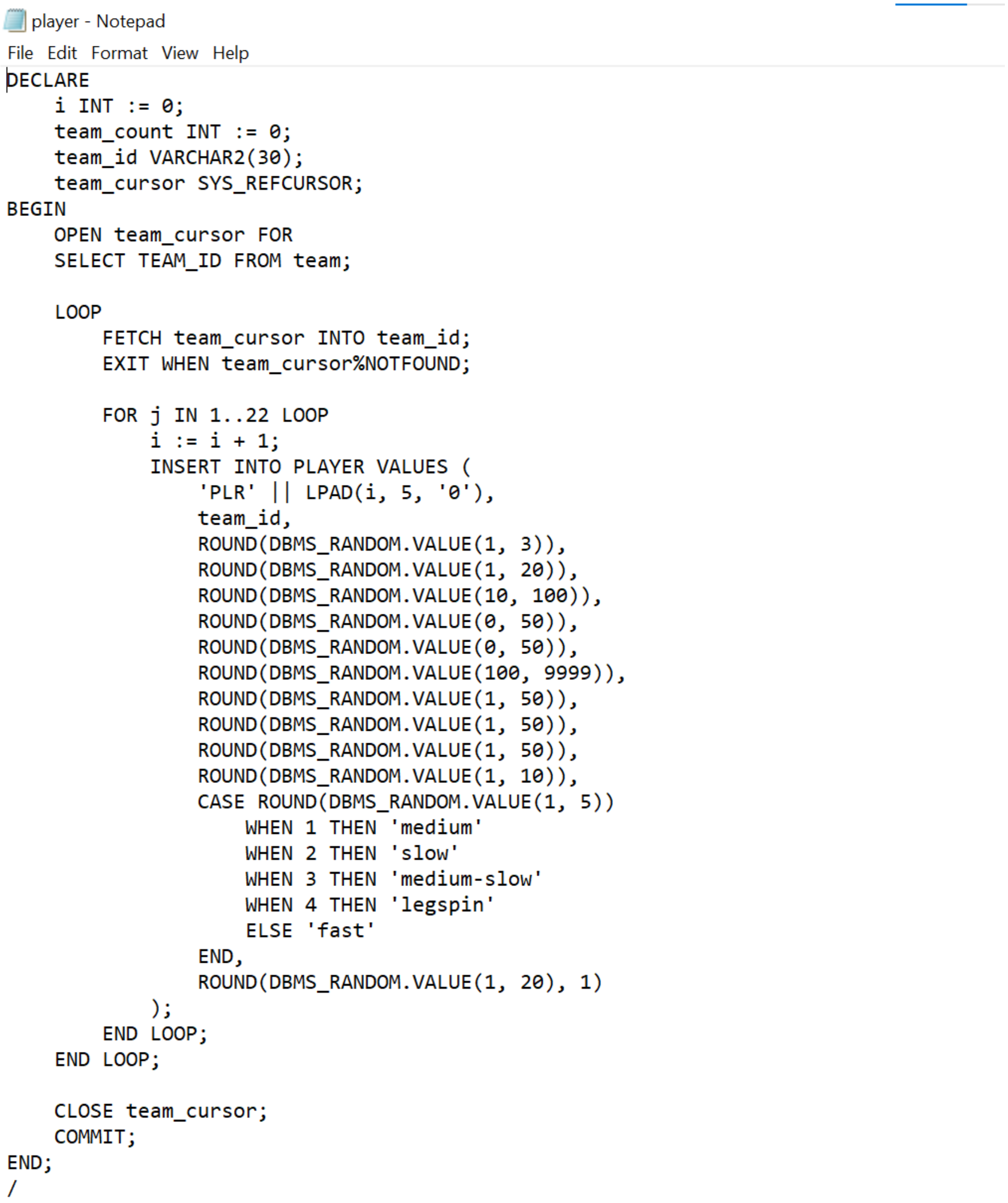
End of Loops:

- The outer loop (END LOOP;) continues until all teams are processed.
- The inner loop generates players for each team.

Close Cursor and Commit:

- CLOSE team_cursor;: Close the cursor after processing all teams.
- COMMIT;: Commit the changes to make them permanent in the database.

The below figure 9.1 depicts the implementation of the above cursor



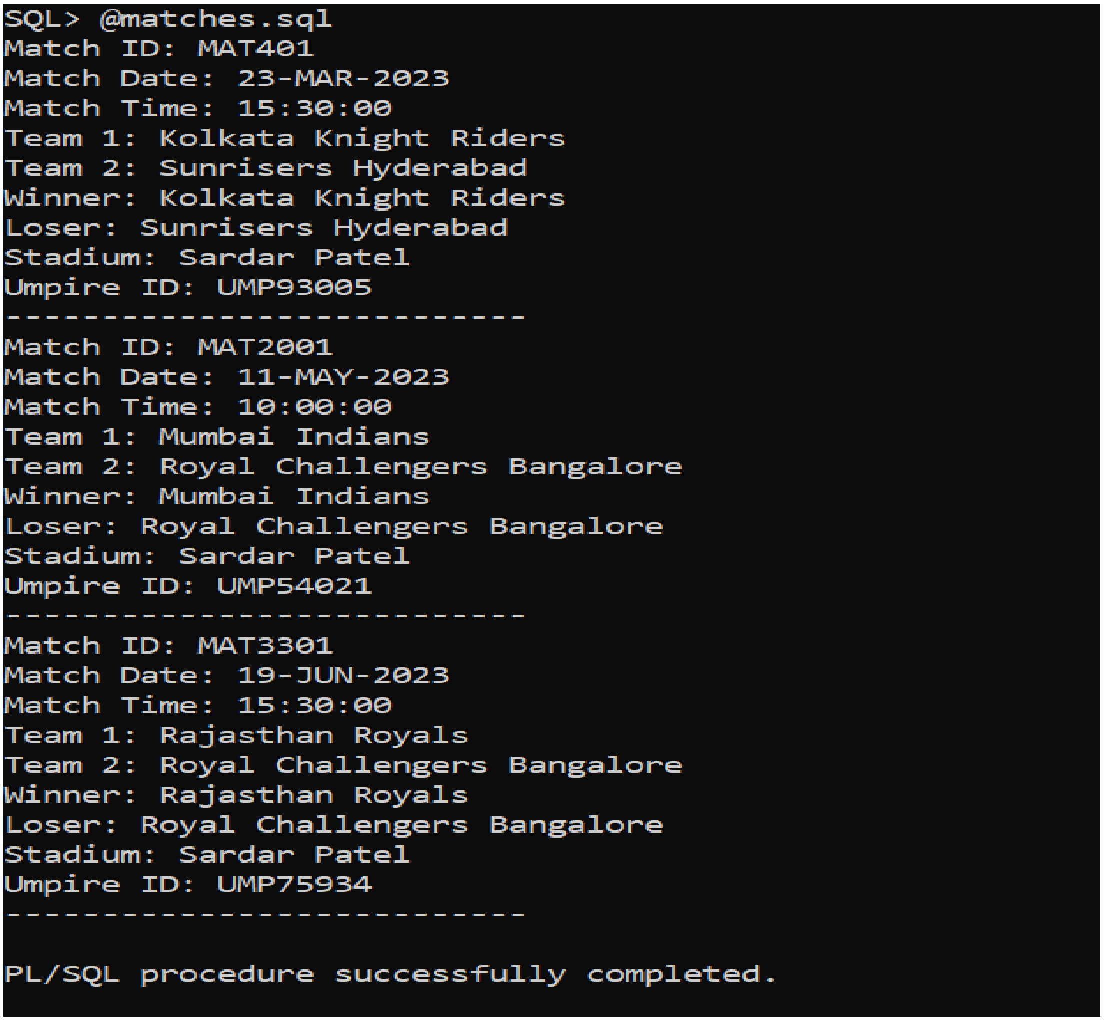
```
DECLARE
    i INT := 0;
    team_count INT := 0;
    team_id VARCHAR2(30);
    team_cursor SYS_REFCURSOR;
BEGIN
    OPEN team_cursor FOR
    SELECT TEAM_ID FROM team;

    LOOP
        FETCH team_cursor INTO team_id;
        EXIT WHEN team_cursor%NOTFOUND;

        FOR j IN 1..22 LOOP
            i := i + 1;
            INSERT INTO PLAYER VALUES (
                'PLR' || LPAD(i, 5, '0'),
                team_id,
                ROUND(DBMS_RANDOM.VALUE(1, 3)),
                ROUND(DBMS_RANDOM.VALUE(1, 20)),
                ROUND(DBMS_RANDOM.VALUE(10, 100)),
                ROUND(DBMS_RANDOM.VALUE(0, 50)),
                ROUND(DBMS_RANDOM.VALUE(0, 50)),
                ROUND(DBMS_RANDOM.VALUE(100, 9999)),
                ROUND(DBMS_RANDOM.VALUE(1, 50)),
                ROUND(DBMS_RANDOM.VALUE(1, 50)),
                ROUND(DBMS_RANDOM.VALUE(1, 50)),
                ROUND(DBMS_RANDOM.VALUE(1, 10)),
                CASE ROUND(DBMS_RANDOM.VALUE(1, 5))
                    WHEN 1 THEN 'medium'
                    WHEN 2 THEN 'slow'
                    WHEN 3 THEN 'medium-slow'
                    WHEN 4 THEN 'legspin'
                    ELSE 'fast'
                END,
                ROUND(DBMS_RANDOM.VALUE(1, 20), 1)
            );
        END LOOP;
    END LOOP;

    CLOSE team_cursor;
    COMMIT;
END;
/
```

Figure 9.

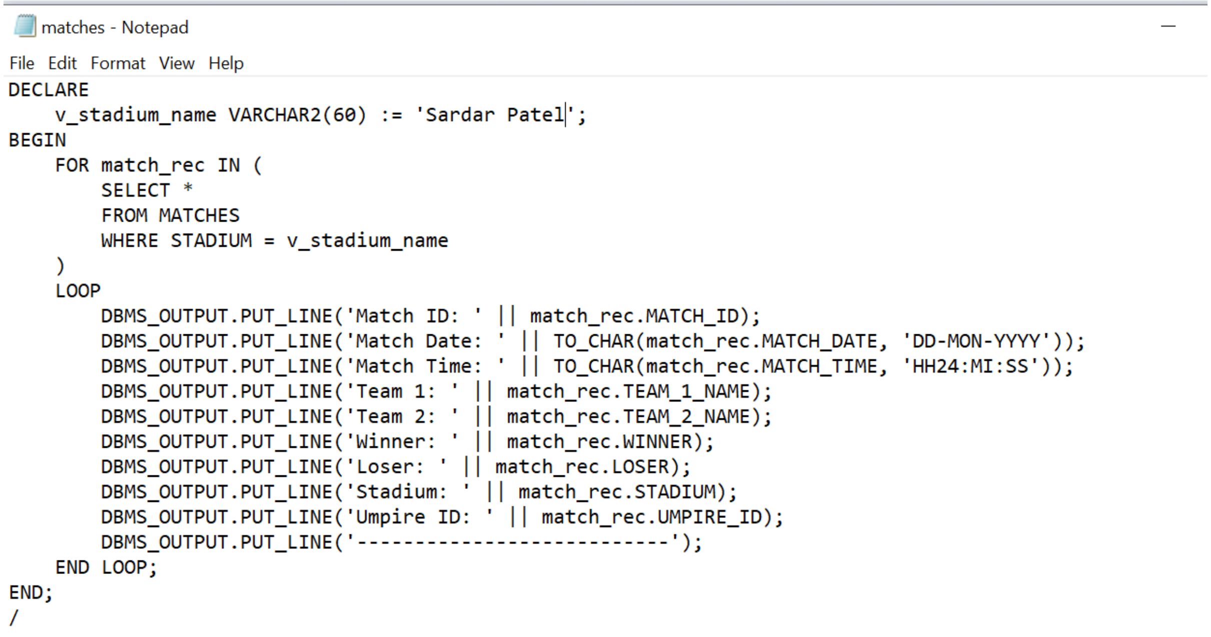
2. PL/SQL Code to retrieve details of the matches which are held at Sardar patel stadium.

In this PL/SQL block:

- We declare a variable v_stadium_name to hold the stadium name we want to search for.
- The FOR loop fetches all records from the MATCHES table where the stadium name matches v_stadium_name.
- Inside the loop, we use DBMS_OUTPUT.PUT_LINE to display details of each match such as Match ID, Match Date, Match Time, Team names, Winner, Loser, Stadium, and Umpire ID.
- The loop iterates through each match record that matches the stadium name criteria. The below figure 9.2 depicts the above cursor



```
SQL> @matches.sql
Match ID: MAT401
Match Date: 23-MAR-2023
Match Time: 15:30:00
Team 1: Kolkata Knight Riders
Team 2: Sunrisers Hyderabad
Winner: Kolkata Knight Riders
Loser: Sunrisers Hyderabad
Stadium: Sardar Patel
Umpire ID: UMP93005
---------------------------
Match ID: MAT2001
Match Date: 11-MAY-2023
Match Time: 10:00:00
Team 1: Mumbai Indians
Team 2: Royal Challengers Bangalore
Winner: Mumbai Indians
Loser: Royal Challengers Bangalore
Stadium: Sardar Patel
Umpire ID: UMP54021
---------------------------
Match ID: MAT3301
Match Date: 19-JUN-2023
Match Time: 15:30:00
Team 1: Rajasthan Royals
Team 2: Royal Challengers Bangalore
Winner: Rajasthan Royals
Loser: Royal Challengers Bangalore
Stadium: Sardar Patel
Umpire ID: UMP75934
---------------------------

PL/SQL procedure successfully completed.
```

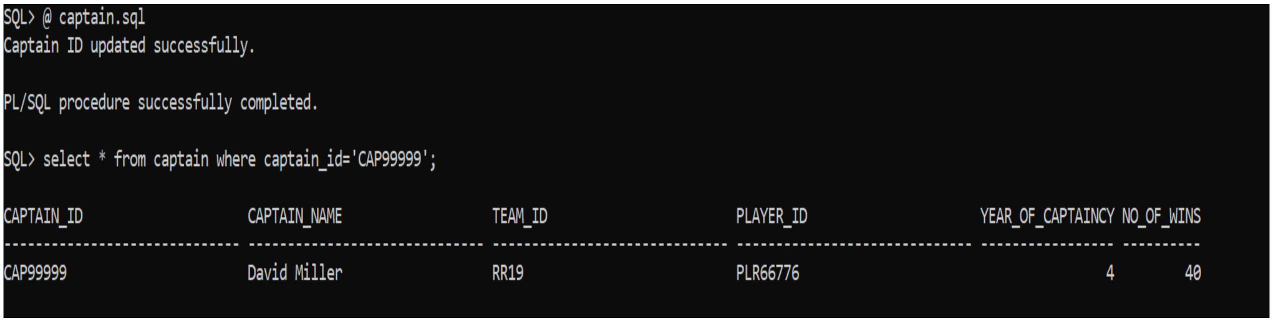


```
DECLARE
    v_stadium_name VARCHAR2(60) := 'Sardar Patel';
BEGIN
    FOR match_rec IN (
        SELECT *
        FROM MATCHES
        WHERE STADIUM = v_stadium_name
    )
    LOOP
        DBMS_OUTPUT.PUT_LINE('Match ID: ' || match_rec.MATCH_ID);
        DBMS_OUTPUT.PUT_LINE('Match Date: ' || TO_CHAR(match_rec.MATCH_DATE, 'DD-MON-YYYY'));
        DBMS_OUTPUT.PUT_LINE('Match Time: ' || TO_CHAR(match_rec.MATCH_TIME, 'HH24:MI:SS'));
        DBMS_OUTPUT.PUT_LINE('Team 1: ' || match_rec.TEAM_1_NAME);
        DBMS_OUTPUT.PUT_LINE('Team 2: ' || match_rec.TEAM_2_NAME);
        DBMS_OUTPUT.PUT_LINE('Winner: ' || match_rec.WINNER);
        DBMS_OUTPUT.PUT_LINE('Loser: ' || match_rec.LOSER);
        DBMS_OUTPUT.PUT_LINE('Stadium: ' || match_rec.STADIUM);
        DBMS_OUTPUT.PUT_LINE('Umpire ID: ' || match_rec.UMPIRE_ID);
        DBMS_OUTPUT.PUT_LINE('---------------------------');
    END LOOP;
END;
/
```

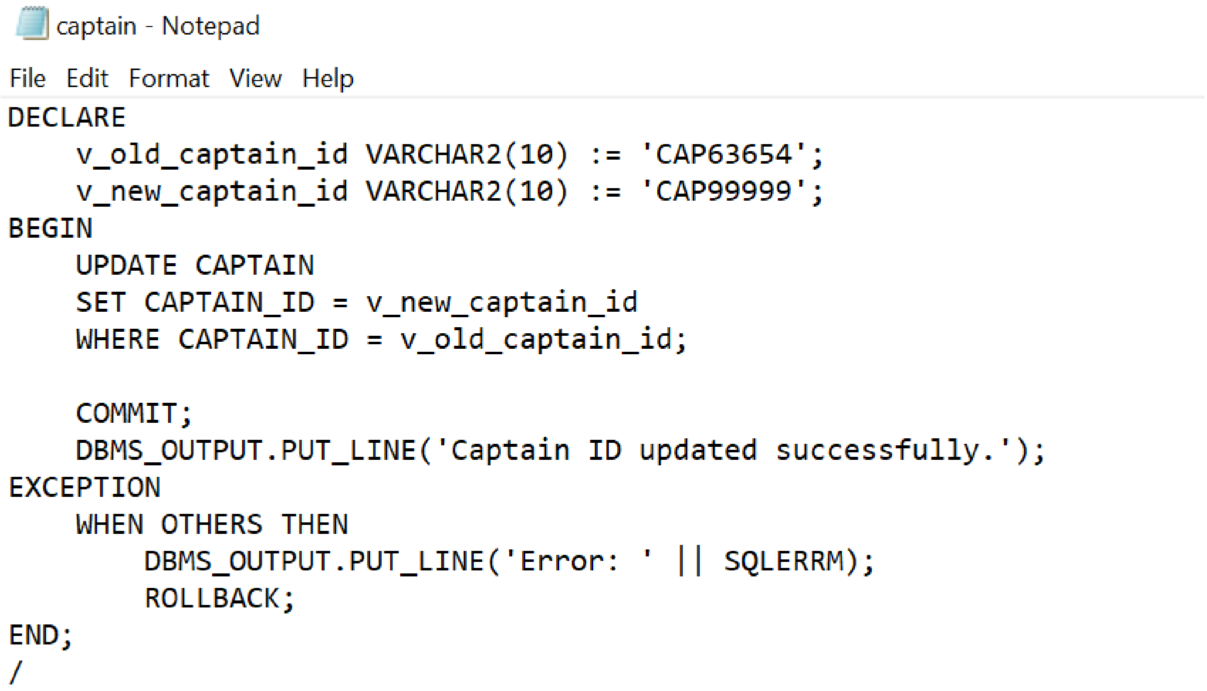
Figure 9.2

3. PL/SQL Code to update the captain id of the captain table.

This PL/SQL block will update the captain ID from "CAP63654" to "CAP99999" in the "CAPTAIN" table. Make sure to execute this script in your SQL environment, and it will display "Captain ID updated successfully." if the update is successful. If there's an error during the update process, it will display the error message. The COMMIT statement is used to commit the changes to the database, and the ROLLBACK statement is there to handle exceptions by rolling back the changes if an error occurs. The below figure 9.3 demonstrates the above



```
SQL> @ captain.sql
Captain ID updated successfully.

PL/SQL procedure successfully completed.

SQL> select * from captain where captain_id='CAP99999';

CAPTAIN_ID                     CAPTAIN_NAME                   TEAM_ID                        PLAYER_ID                      YEAR_OF_CAPTAINCY NO_OF_WINS
------------------------------ ------------------------------ ------------------------------ ------------------------------ ----------------- ----------
CAP99999                       David Miller                   RR19                           PLR66776                                       4         40
```



```
DECLARE
    v_old_captain_id VARCHAR2(10) := 'CAP63654';
    v_new_captain_id VARCHAR2(10) := 'CAP99999';
BEGIN
    UPDATE CAPTAIN
    SET CAPTAIN_ID = v_new_captain_id
    WHERE CAPTAIN_ID = v_old_captain_id;

    COMMIT;
    DBMS_OUTPUT.PUT_LINE('Captain ID updated successfully.');
EXCEPTION
    WHEN OTHERS THEN
        DBMS_OUTPUT.PUT_LINE('Error: ' || SQLERRM);
        ROLLBACK;
END;
/
```

Figure 9.3

CHAPTER 10

Working With Triggers

What are Triggers?

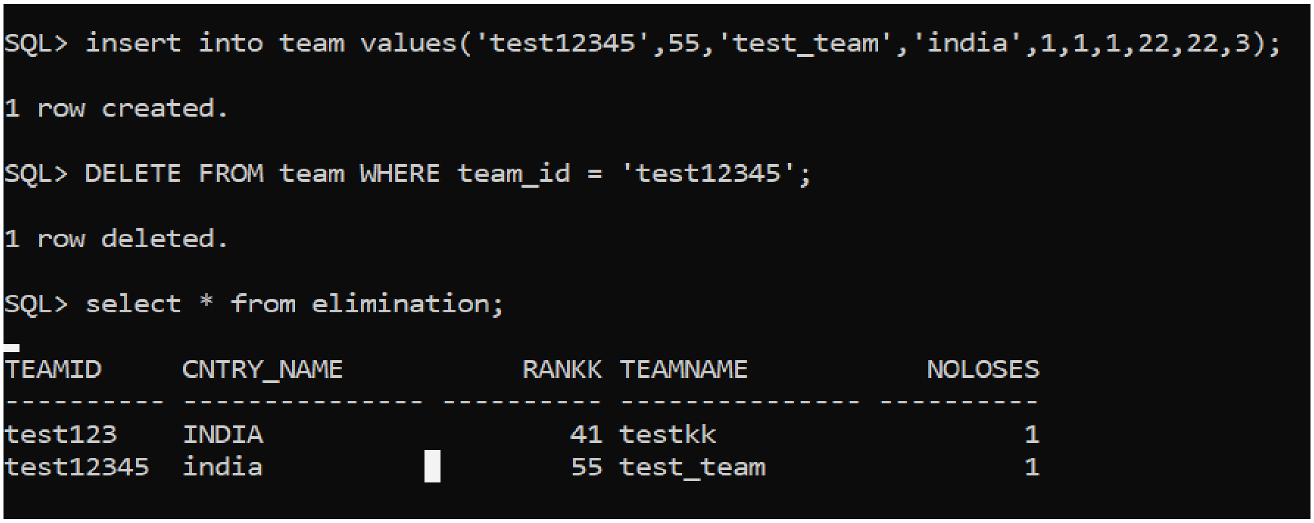
Triggers in database management systems are special stored procedures that automatically execute in response to specific events, such as INSERT, UPDATE, DELETE, or user logins. They enforce data integrity, implement business rules, and automate tasks, with row-level triggers acting on each affected row and statement-level triggers operating on the overall event, providing essential automation and logic enforcement in database operations.

Trigger 1

When a team is eliminated, do the necessary process and update the elimination table.

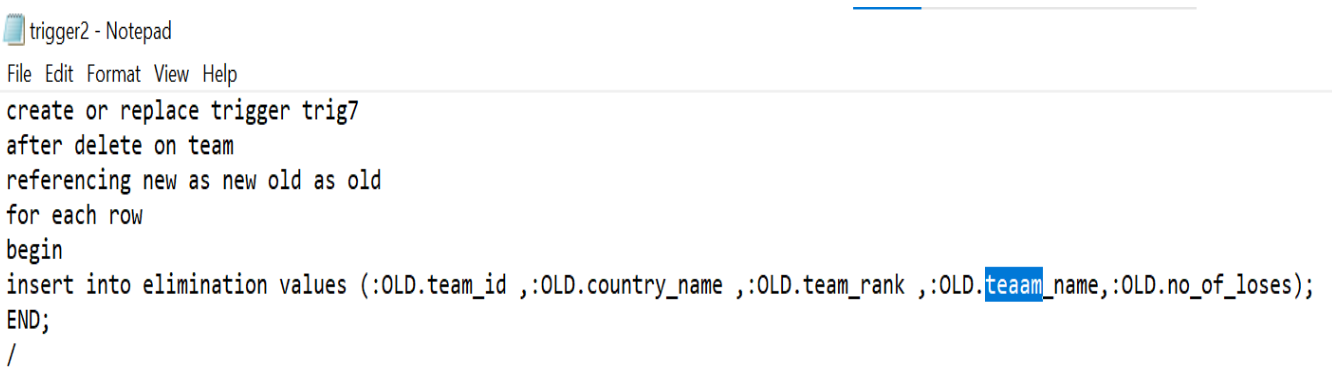
- This trigger is designed to capture information about deleted rows from the team table and store it in the elimination table.
- When a row is deleted from team, the trigger fires (AFTER DELETE) and inserts a corresponding row into the elimination table using the old values (:OLD) of the deleted row's columns.
- The trigger's logic assumes that elimination table has columns corresponding to team_id, country_name, team_rank, team_name, and no_of_loses, and it uses the old values (:OLD) of these columns from the deleted row in team to populate the elimination table.

The below figure 10.1.1 and 10.1.2 shows the demonstration of the above trigger.



```
SQL> insert into team values('test12345',55,'test_team','india',1,1,1,22,22,3);

1 row created.

SQL> DELETE FROM team WHERE team_id = 'test12345';

1 row deleted.

SQL> select * from elimination;

TEAMID     CNTRY_NAME           RANKK TEAMNAME           NOLOSES
---------- --------------- ---------- --------------- ----------
test123    INDIA                   41 testkk                   1
test12345  india                   55 test_team                1
```

Figure 10.1.1



```
create or replace trigger trig7
after delete on team
referencing new as new old as old
for each row
begin
insert into elimination values (:OLD.team_id ,:OLD.country_name ,:OLD.team_rank ,:OLD.teaam_name,:OLD.no_of_loses);
END;
/
```

Figure 10.1.2

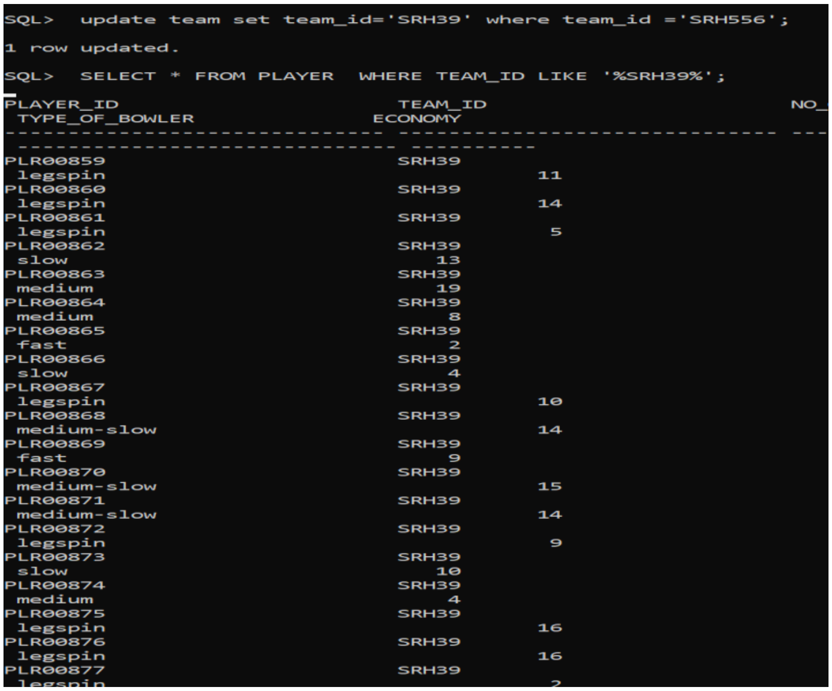
Trigger 2

Due to some malpractices a team was banned for 2 years . After 2 years when it came back the board of cricket council order to change the team_ID because of some reasons

Explanation:

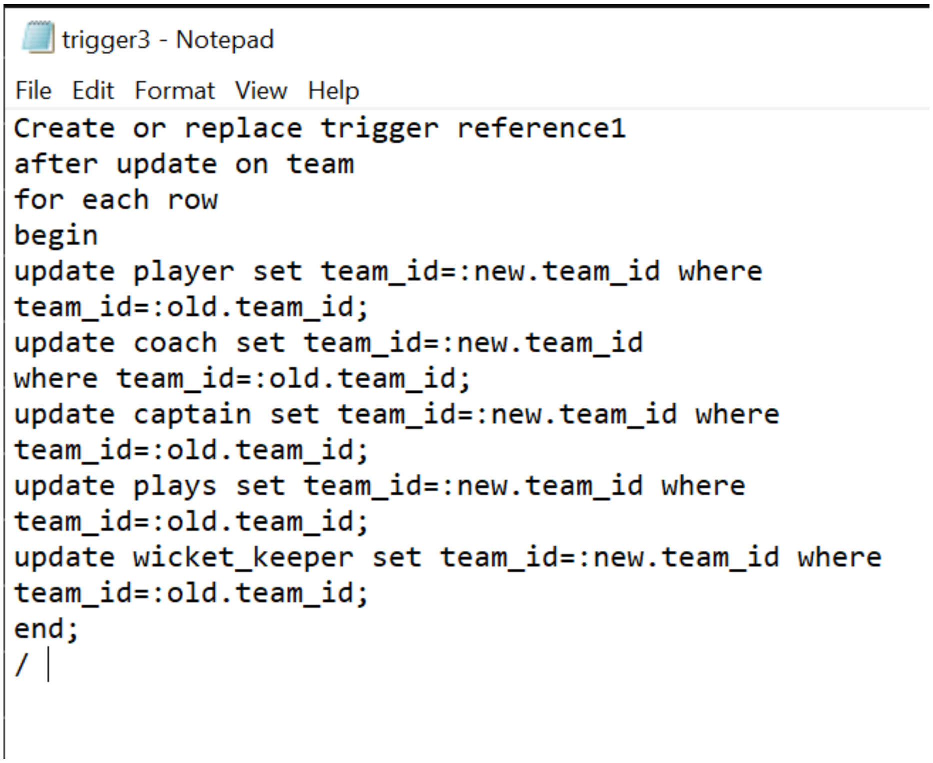
- CREATE OR REPLACE TRIGGER: This statement creates or replaces a trigger named REFERENCE1.
- AFTER UPDATE ON team: The trigger is fired after an UPDATE operation is performed on the team table.
- FOR EACH ROW: Indicates that the trigger fires once for each row affected by the UPDATE operation.
- BEGIN ... END: Encloses the trigger's executable statements.
- UPDATE ... SET ... WHERE ...: These are the SQL statements inside the trigger's body.
    - Each UPDATE statement updates the team_id in a related table (player, coach, captain, plays, wicket_keeper) based on the old team_id (:old.team_id) and the new team_id (:new.team_id) from the team table.
    - For example, when a team_id is updated in the team table, this trigger ensures that all corresponding records in related tables are also updated to reflect the new team_id.

This trigger is useful for maintaining data integrity and consistency across related tables when there are changes to the team_id in the team table. It helps to synchronize the team_id values across different tables that are linked by this foreign key relationship



```
SQL>  update team set team_id='SRH39' where team_id ='SRH556';

1 row updated.

SQL>  SELECT * FROM PLAYER  WHERE TEAM_ID LIKE '%SRH39%';

PLAYER_ID                      TEAM_ID                        NO_
 TYPE_OF_BOWLER              ECONOMY
------------------------------ ------------------------------ ---
 ------------------------------ ----------
PLR00859                       SRH39
 legspin                                  11
PLR00860                       SRH39
 legspin                                  14
PLR00861                       SRH39
 legspin                                   5
PLR00862                       SRH39
 slow                             13
PLR00863                       SRH39
 medium                           19
PLR00864                       SRH39
 medium                            8
PLR00865                       SRH39
 fast                              2
PLR00866                       SRH39
 slow                              4
PLR00867                       SRH39
 legspin                                  10
PLR00868                       SRH39
 medium-slow                              14
PLR00869                       SRH39
 fast                              9
PLR00870                       SRH39
 medium-slow                              15
PLR00871                       SRH39
 medium-slow                              14
PLR00872                       SRH39
 legspin                                   9
PLR00873                       SRH39
 slow                             10
PLR00874                       SRH39
 medium                            4
PLR00875                       SRH39
 legspin                                  16
PLR00876                       SRH39
 legspin                                  16
PLR00877                       SRH39
 legspin                                   2
```

Figure 10.2.1



```
Create or replace trigger reference1
after update on team
for each row
begin
update player set team_id=:new.team_id where
team_id=:old.team_id;
update coach set team_id=:new.team_id
where team_id=:old.team_id;
update captain set team_id=:new.team_id where
team_id=:old.team_id;
update plays set team_id=:new.team_id where
team_id=:old.team_id;
update wicket_keeper set team_id=:new.team_id where
team_id=:old.team_id;
end;
/
```

Figure 10.2.2

CHAPTER 11

What are Functional Dependencies?

Functional dependencies are a fundamental concept in database management systems (DBMS) that describe the relationships between attributes (columns) in a relation (table). A functional dependency exists when the value of one attribute uniquely determines the value of another attribute(s) in the same table. In other words, if knowing the value of attribute A allows you to determine the value of attribute B, then A functionally determines B, represented as A -> B.

FINDING FUNCTIONAL DEPENDENCIES

1. **Table TEAM**

   A. TEAM_ID -> {TEAM_RANK, TEAM_NAME, COUNTRY_NAME, NO_OF_WINS, NO_OF_LOSES, NO_OF_DRAWS, NO_OF_BOWLERS, NO_OF_BATSMEN, TOTAL_MATCHES}

2. **Table WICKET_KEEPER**

   A. TEAM_ID -> WK_NAME
   B. WK_NAME -> TEAM_ID

3. **Table UMPIRE**

   A. UMPIRE_ID -> {UMPIRE_NAME, NO_OF_MATCHES, COUNTRY}
   B. UMPIRE_NAME -> {UMPIRE_ID, NO_OF_MATCHES, COUNTRY}
   C. UMPIRE_ID, UMPIRE_NAME -> {NO_OF_MATCHES, COUNTRY}

4. **Table PLAYER**

   A. PLAYER_ID -> {TEAM_ID, NO_OF_WORLDCUPS, NO_OF_MATCHES, BATTING_AVERAGE, NO_OF_SIXES, NO_OF_FOURS, NO_OF_TOTALRUNS, NO_OF_T20, NO_OF_ODI, NO_OF_TEST, NO_OF_WICKETS, TYPE_OF_BOWLER, ECONOMY}
   B. TEAM_ID -> {PLAYER_ID}

5. Table COACH

A. COACH_ID -> {TEAM_ID, COACH_NAME}
B. TEAM_ID -> {COACH_ID, COACH_NAME}

6. Table CAPTAIN

A. CAPTAIN_ID -> {CAPTAIN_NAME, TEAM_ID, PLAYER_ID, YEAR_OF_CAPTAINCY, NO_OF_WINS}
B. TEAM_ID -> {CAPTAIN_ID, CAPTAIN_NAME, PLAYER_ID, YEAR_OF_CAPTAINCY, NO_OF_WINS}
C. PLAYER_ID -> {CAPTAIN_ID, CAPTAIN_NAME, TEAM_ID, YEAR_OF_CAPTAINCY, NO_OF_WINS}

7. Table MATCHES

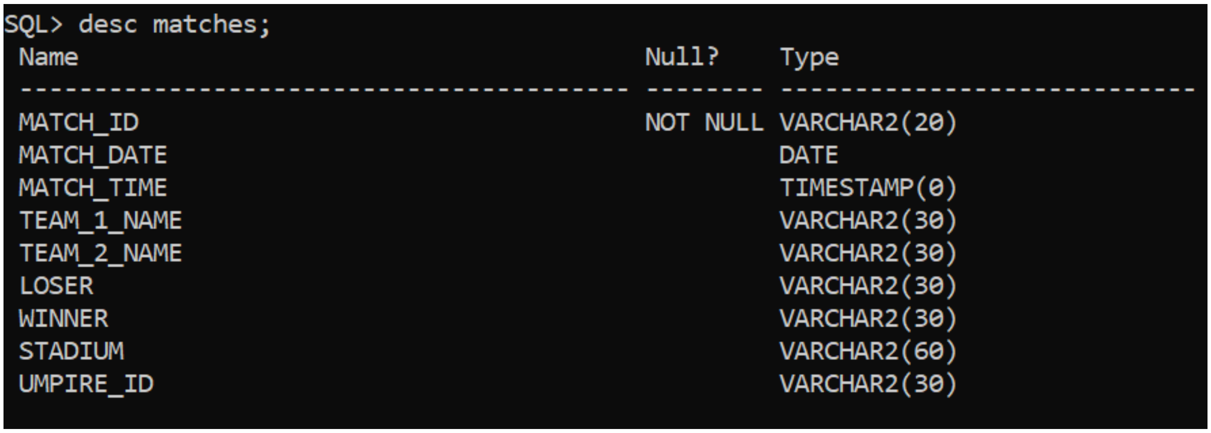
A. MATCH_ID -> {MATCH_DATE, MATCH_TIME, TEAM_1_NAME, TEAM_2_NAME, LOSER, WINNER, STADIUM, UMPIRE_ID}
B. TEAM_1_NAME, TEAM_2_NAME -> {MATCH_ID, MATCH_DATE, MATCH_TIME, LOSER, WINNER, STADIUM, UMPIRE_ID}
C. UMPIRE_ID -> {MATCH_ID, MATCH_DATE, MATCH_TIME, TEAM_1_NAME, TEAM_2_NAME, LOSER, WINNER, STADIUM}

CHAPTER 12

NORMALIZATION

1. Table MATCHES

The initial schema for the table is given by the following figure 12.1 shown below



```
SQL> desc matches;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 MATCH_ID                                  NOT NULL VARCHAR2(20)
 MATCH_DATE                                         DATE
 MATCH_TIME                                         TIMESTAMP(0)
 TEAM_1_NAME                                        VARCHAR2(30)
 TEAM_2_NAME                                        VARCHAR2(30)
 LOSER                                              VARCHAR2(30)
 WINNER                                             VARCHAR2(30)
 STADIUM                                            VARCHAR2(60)
 UMPIRE_ID                                          VARCHAR2(30)
```

Figure 12.1

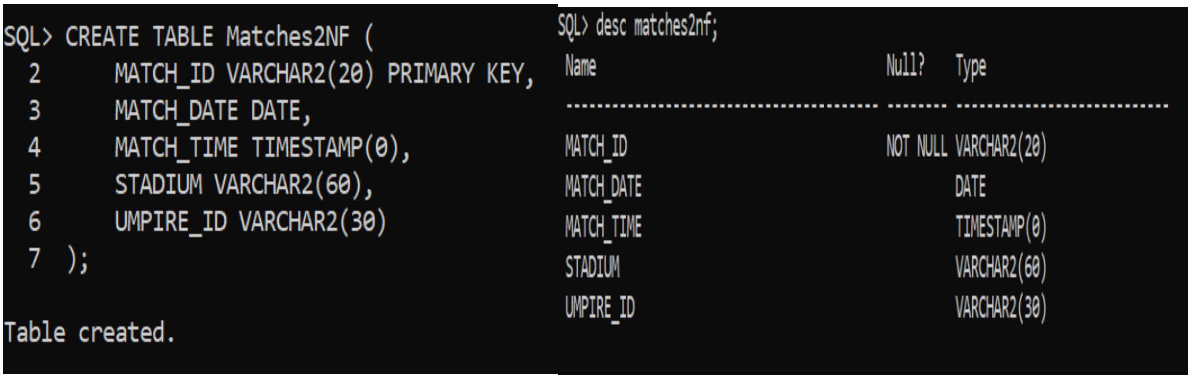
The table is already in **1NF** since all the instances of the attributes are **atomic and no multi values** exist.

Identifying the Functional Dependencies

A. MATCH_ID -> MATCH_DATE, MATCH_TIME, TEAM_1_NAME, TEAM_2_NAME, LOSER, WINNER, STADIUM, UMPIRE_ID **(CLOSURE)**
B. MATCH_DATE, MATCH_TIME -> MATCH_ID **(PARTIAL DEPENDENCY)**

Since PARTIAL DEPENDENCY exist we are undergoing 2NF and splitting the relation as follows

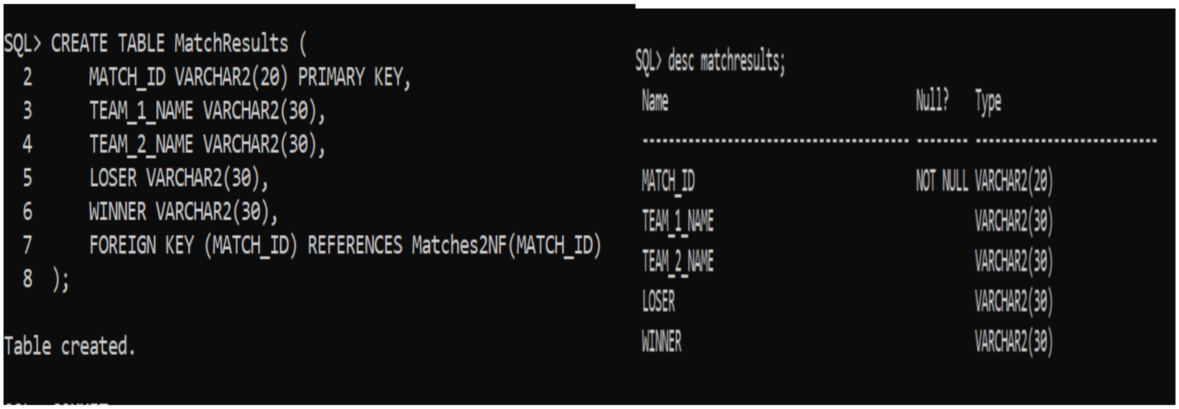
First Table: Matches2NF



```
SQL> CREATE TABLE Matches2NF (
  2      MATCH_ID VARCHAR2(20) PRIMARY KEY,
  3      MATCH_DATE DATE,
  4      MATCH_TIME TIMESTAMP(0),
  5      STADIUM VARCHAR2(60),
  6      UMPIRE_ID VARCHAR2(30)
  7  );

Table created.
```

```
SQL> desc matches2nf;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 MATCH_ID                                  NOT NULL VARCHAR2(20)
 MATCH_DATE                                         DATE
 MATCH_TIME                                         TIMESTAMP(0)
 STADIUM                                            VARCHAR2(60)
 UMPIRE_ID                                          VARCHAR2(30)
```

Second Table: Match Results



```
SQL> CREATE TABLE MatchResults (
  2      MATCH_ID VARCHAR2(20) PRIMARY KEY,
  3      TEAM_1_NAME VARCHAR2(30),
  4      TEAM_2_NAME VARCHAR2(30),
  5      LOSER VARCHAR2(30),
  6      WINNER VARCHAR2(30),
  7      FOREIGN KEY (MATCH_ID) REFERENCES Matches2NF(MATCH_ID)
  8  );

Table created.
```

```
SQL> desc matchresults;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 MATCH_ID                                  NOT NULL VARCHAR2(20)
 TEAM_1_NAME                                        VARCHAR2(30)
 TEAM_2_NAME                                        VARCHAR2(30)
 LOSER                                              VARCHAR2(30)
 WINNER                                             VARCHAR2(30)
```

In the above decomposition:

- The "Matches2NF" table contains information directly related to each match, with MATCH_ID as the primary key.
- The "Match Results" table contains information related to the teams, winner, and loser, with MATCH_ID as a foreign key referencing the "Matches" table.

This decomposition helps in reducing data redundancy and ensures that each table represents a distinct entity without partial dependencies.

Now Analysing the Functional Dependencies for the table Matches2NF

a. MATCH_DATE -> MATCH_TIME

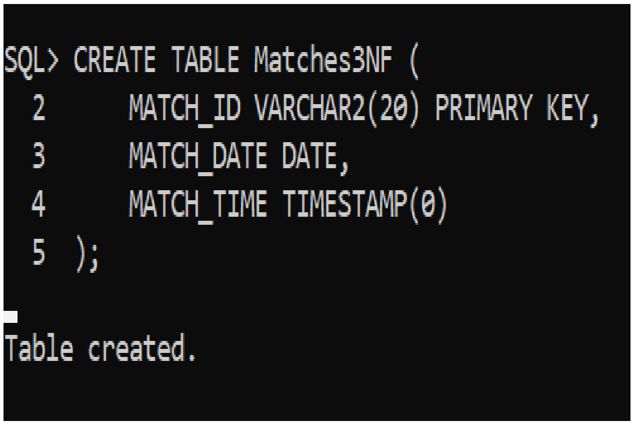
b. UMPIRE_ID -> MATCH_ID

The combination of these dependencies create a **transitive dependency**

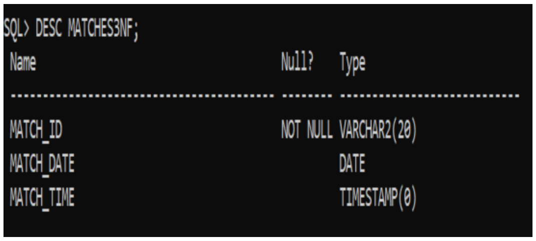
MATCH_DATE -> MATCH_ID <- UMPIRE_ID. This means that UMPIRE_ID is **transitively** dependent on MATCH_DATE through MATCH_ID.

Since TRANSITIVE DEPENDENCY exist we are undergoing 3NF and splitting the relation as follows

First Table: Matches3NF

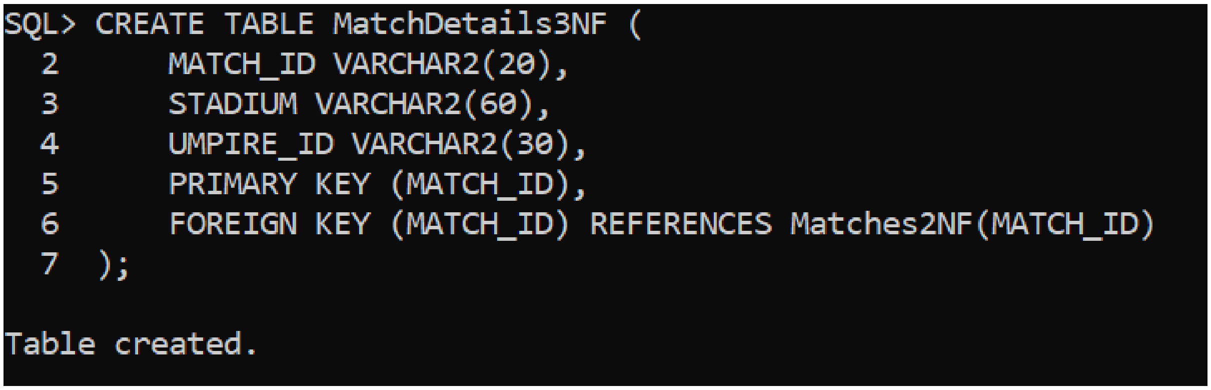


```
SQL> CREATE TABLE Matches3NF (
  2      MATCH_ID VARCHAR2(20) PRIMARY KEY,
  3      MATCH_DATE DATE,
  4      MATCH_TIME TIMESTAMP(0)
  5  );

Table created.
```



```
SQL> DESC MATCHES3NF;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 MATCH_ID                                  NOT NULL VARCHAR2(20)
 MATCH_DATE                                         DATE
 MATCH_TIME                                         TIMESTAMP(0)
```

Second Table: Match Results 3NF



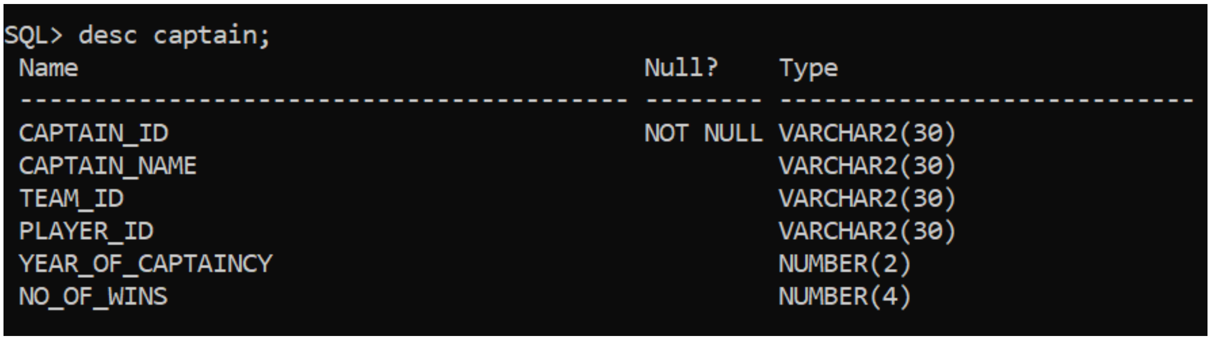
```
SQL> CREATE TABLE MatchDetails3NF (
  2      MATCH_ID VARCHAR2(20),
  3      STADIUM VARCHAR2(60),
  4      UMPIRE_ID VARCHAR2(30),
  5      PRIMARY KEY (MATCH_ID),
  6      FOREIGN KEY (MATCH_ID) REFERENCES Matches2NF(MATCH_ID)
  7  );

Table created.
```

There are no transitive dependencies in these tables, and each table represents a distinct entity with no non-key attributes functionally depending on other non-key attributes within the same table. This structure is in Third Normal Form (3NF).

Hence the Table MATCHES is finally **NORMALIZED**

2. Table CAPTAIN

The initial schema for the table is given by the following figure 12.2 shown below



```
SQL> desc captain;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 CAPTAIN_ID                                NOT NULL VARCHAR2(30)
 CAPTAIN_NAME                                       VARCHAR2(30)
 TEAM_ID                                            VARCHAR2(30)
 PLAYER_ID                                          VARCHAR2(30)
 YEAR_OF_CAPTAINCY                                  NUMBER(2)
 NO_OF_WINS                                         NUMBER(4)
```

Figure 12.2

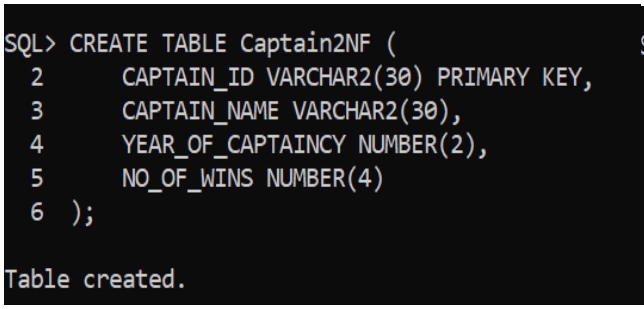
The table is already in **1NF** since all the instances of the attributes are **atomic and no multi values** exist.

Identifying the Functional Dependencies

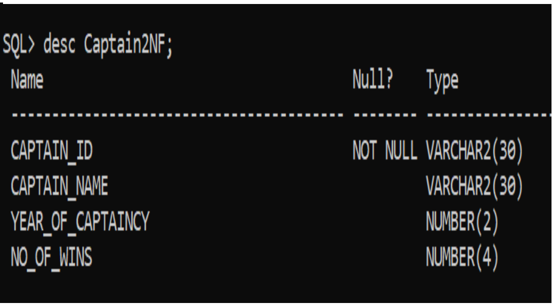
A. CAPTAIN_ID -> {CAPTAIN_NAME, TEAM_ID, PLAYER_ID, YEAR_OF_CAPTAINCY, NO_OF_WINS} **(CLOSURE)**
B. CAPTAIN_ID -> TEAM_ID (**PARTIAL DEPENDENCY**)
C. CAPTAIN_ID -> PLAYER_ID (**PARTIAL DEPENDENCY**)

Since PARTIAL DEPENDENCY exist we are undergoing 2NF and splitting the relation as follows

First Table: Captain2NF

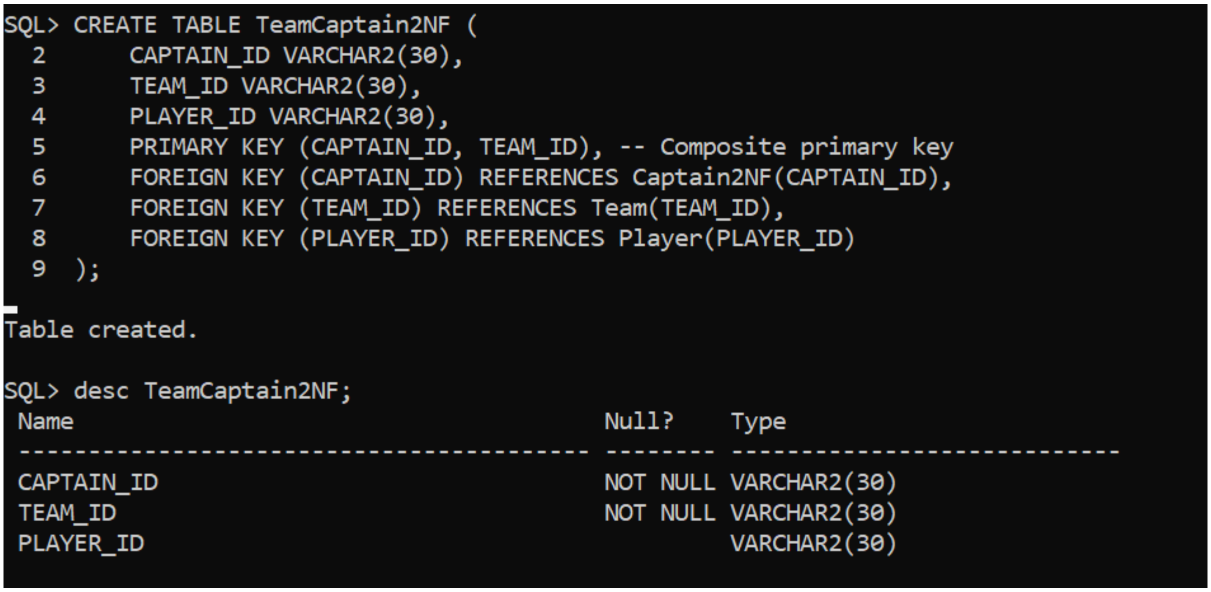


```
SQL> CREATE TABLE Captain2NF (
  2      CAPTAIN_ID VARCHAR2(30) PRIMARY KEY,
  3      CAPTAIN_NAME VARCHAR2(30),
  4      YEAR_OF_CAPTAINCY NUMBER(2),
  5      NO_OF_WINS NUMBER(4)
  6  );

Table created.
```



```
SQL> desc Captain2NF;
 Name                                      Null?    Type
 ----------------------------------------- -------- ---------------
 CAPTAIN_ID                                NOT NULL VARCHAR2(30)
 CAPTAIN_NAME                                       VARCHAR2(30)
 YEAR_OF_CAPTAINCY                                  NUMBER(2)
 NO_OF_WINS                                         NUMBER(4)
```

Second Table: TeamCaptain2NF



```
SQL> CREATE TABLE TeamCaptain2NF (
         CAPTAIN_ID VARCHAR2(30),
         TEAM_ID VARCHAR2(30),
         PLAYER_ID VARCHAR2(30),
         PRIMARY KEY (CAPTAIN_ID, TEAM_ID), -- Composite primary key
         FOREIGN KEY (CAPTAIN_ID) REFERENCES Captain2NF(CAPTAIN_ID),
         FOREIGN KEY (TEAM_ID) REFERENCES Team(TEAM_ID),
         FOREIGN KEY (PLAYER_ID) REFERENCES Player(PLAYER_ID)
     );

Table created.

SQL> desc TeamCaptain2NF;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 CAPTAIN_ID                                NOT NULL VARCHAR2(30)
 TEAM_ID                                   NOT NULL VARCHAR2(30)
 PLAYER_ID                                          VARCHAR2(30)
```

This decomposition helps in reducing data redundancy and ensures that each table represents a distinct entity without partial dependencies.

Now Analysing the Functional Dependencies for the table TeamCaptain2NF

A. TEAM_ID -> PLAYER_ID
B. CAPTAIN_ID -> PLAYER_ID

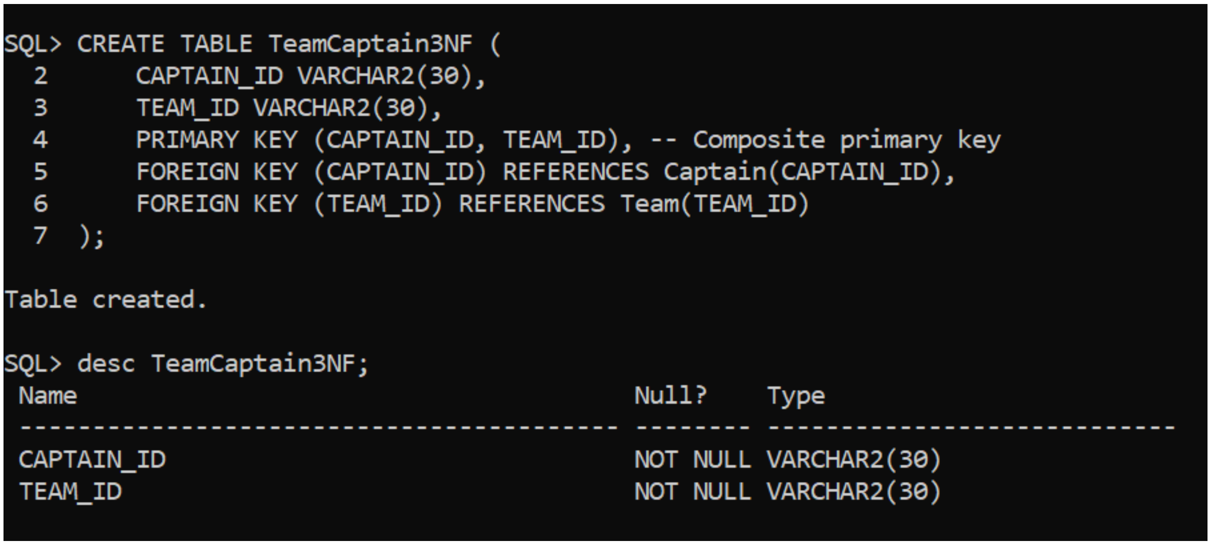
The combination of these dependencies create a **transitive dependency**

- CAPTAIN_ID -> TEAM_ID -> PLAYER_ID

This means that a captain's ID indirectly determines a player's ID through the team they lead.

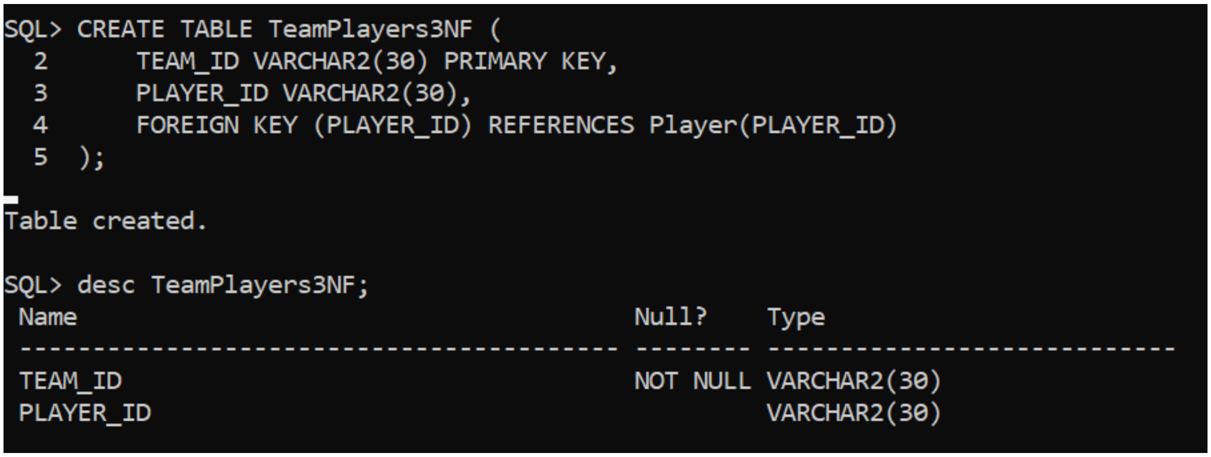
Since TRANSITIVE DEPENDENCY exist we are undergoing 3NF and splitting the relation as follows

First Table: TeamCaptain3NF



```
SQL> CREATE TABLE TeamCaptain3NF (
         CAPTAIN_ID VARCHAR2(30),
         TEAM_ID VARCHAR2(30),
         PRIMARY KEY (CAPTAIN_ID, TEAM_ID), -- Composite primary key
         FOREIGN KEY (CAPTAIN_ID) REFERENCES Captain(CAPTAIN_ID),
         FOREIGN KEY (TEAM_ID) REFERENCES Team(TEAM_ID)
     );

Table created.

SQL> desc TeamCaptain3NF;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 CAPTAIN_ID                                NOT NULL VARCHAR2(30)
 TEAM_ID                                   NOT NULL VARCHAR2(30)
```

Second Table: TeamPlayers3NF



```
SQL> CREATE TABLE TeamPlayers3NF (
         TEAM_ID VARCHAR2(30) PRIMARY KEY,
         PLAYER_ID VARCHAR2(30),
         FOREIGN KEY (PLAYER_ID) REFERENCES Player(PLAYER_ID)
     );

Table created.

SQL> desc TeamPlayers3NF;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 TEAM_ID                                   NOT NULL VARCHAR2(30)
 PLAYER_ID                                          VARCHAR2(30)
```

This decomposition ensures that each table represents a distinct entity with no partial or transitive dependencies within them, following the rules of 2NF and 3NF.

Hence the Table Captain is **NORMALIZED**

CHAPTER 13

WORKING WITH THE TRANSACTIONS

Let’s consider five transactions where Transaction T1 reads the player's name for ID 'PLR33889,' T2 updates their team to 'RCB03,' T3 re-reads the player's name, T4 updates their team to 'MI01,' and T5 reads their name again. Each step reflects operations like reading player data and updating team assignments, typical in sports management systems for tracking player movements and information.

T1:

```
BEGIN TRANSACTION
READ player_name FROM player WHERE player_id = 'PLR33889';
COMMIT TRANSACTION;
```

T2:

```
BEGIN TRANSACTION
UPDATE player SET team_id = 'RCB03' WHERE player_id = 'PLR33889';
COMMIT TRANSACTION;
```

T3:

```
BEGIN TRANSACTION
READ player_name FROM player WHERE player_id = 'PLR33889';
COMMIT TRANSACTION;
```

T4:

```
BEGIN TRANSACTION
UPDATE player SET team_id = 'MI01' WHERE player_id = 'PLR33889';
COMMIT TRANSACTION;
```

T5:

```
BEGIN TRANSACTION
READ player_name FROM player WHERE player_id = 'PLR33889';
COMMIT TRANSACTION;
```

In the above example, T1 reads the player_name of a player with player_id 'PLR33889'. T2 then updates the team_id of the same player, and T3 reads the player_name again. These transactions demonstrate concurrency with a read followed by a write operation on the same data by different transactions.

Concurrency Control

1. Transaction T1:
    - Begin Transaction
    - Read player_name FROM player WHERE player_id = 'PLR33889';
    - Commit Transaction
2. Transaction T2:
    - Begin Transaction
    - Read player_name FROM player WHERE player_id = 'PLR33889';
    - If the record is locked by T1, wait or retry later
    - Otherwise, update player SET team_id = 'RCB03' WHERE player_id = 'PLR33889';
    - Commit Transaction
3. Transaction T3:
    - Begin Transaction
    - Read player_name FROM player WHERE player_id = 'PLR33889';
    - If the record is locked by T1 or T2, wait or retry later
    - Otherwise, proceed with further actions or queries
    - Commit Transaction
4. Transaction T4:
    - Begin Transaction
    - Read player_name FROM player WHERE player_id = 'PLR33889';
    - If the record is locked by T1, T2, or T3, wait or retry later
    - Otherwise, update player SET team_id = 'MI01' WHERE player_id = 'PLR33889';
    - Commit Transaction
5. Transaction T5:
    - Begin Transaction
    - Read player_name FROM player WHERE player_id = 'PLR33889';
    - If the record is locked by T1, T2, T3, or T4, wait or retry later
    - Otherwise, proceed with further actions or queries
    - Commit Transaction

In this concurrency control scheme:

- T1 can read the data without any issue because it's the first transaction.
- T2 needs to wait if T1 is still reading the same record because it intends to update it.
- T3 waits if T1 or T2 is modifying the record but can proceed if they are only reading.
- T4 waits for all previous transactions (T1, T2, T3) to finish before attempting to update.
- T5 waits until all previous transactions have completed before performing its actions.

CHAPTER 14

CONCLUSION

In conclusion, the project centered around managing player information in a sports league demonstrates key aspects of database management and concurrency control. By analyzing transactions that read and update player data along with their team affiliations, we gain insights into the complexities of real-world systems.

The transactions highlighted the importance of concurrency control mechanisms to ensure data consistency and integrity. In a sports management system, where multiple users or processes may access and modify data concurrently, implementing robust concurrency control strategies such as locking mechanisms or transaction isolation levels becomes crucial. These strategies help prevent issues like data anomalies, conflicting updates, or lost updates, ensuring that the database remains accurate and reliable.

Furthermore, the project emphasized the need for careful transaction management, including proper transaction boundaries, commit points, and rollback mechanisms. These aspects play a vital role in maintaining data consistency and ensuring that transactions are executed reliably, even in the presence of failures or concurrent operations.

Overall, the project serves as a practical exploration of database concepts like transactions, concurrency control, and data consistency within the context of sports management systems. It underscores the importance of applying these principles effectively to build robust and dependable database systems for managing dynamic and constantly evolving data scenarios.

REFERENCES

1. Sharma, S., & Gupta, P. (2022). Development of a Cricket Match Statistics Database Using MongoDB and Express.js. In Proceedings of the International Conference on Data Engineering and Information Systems.
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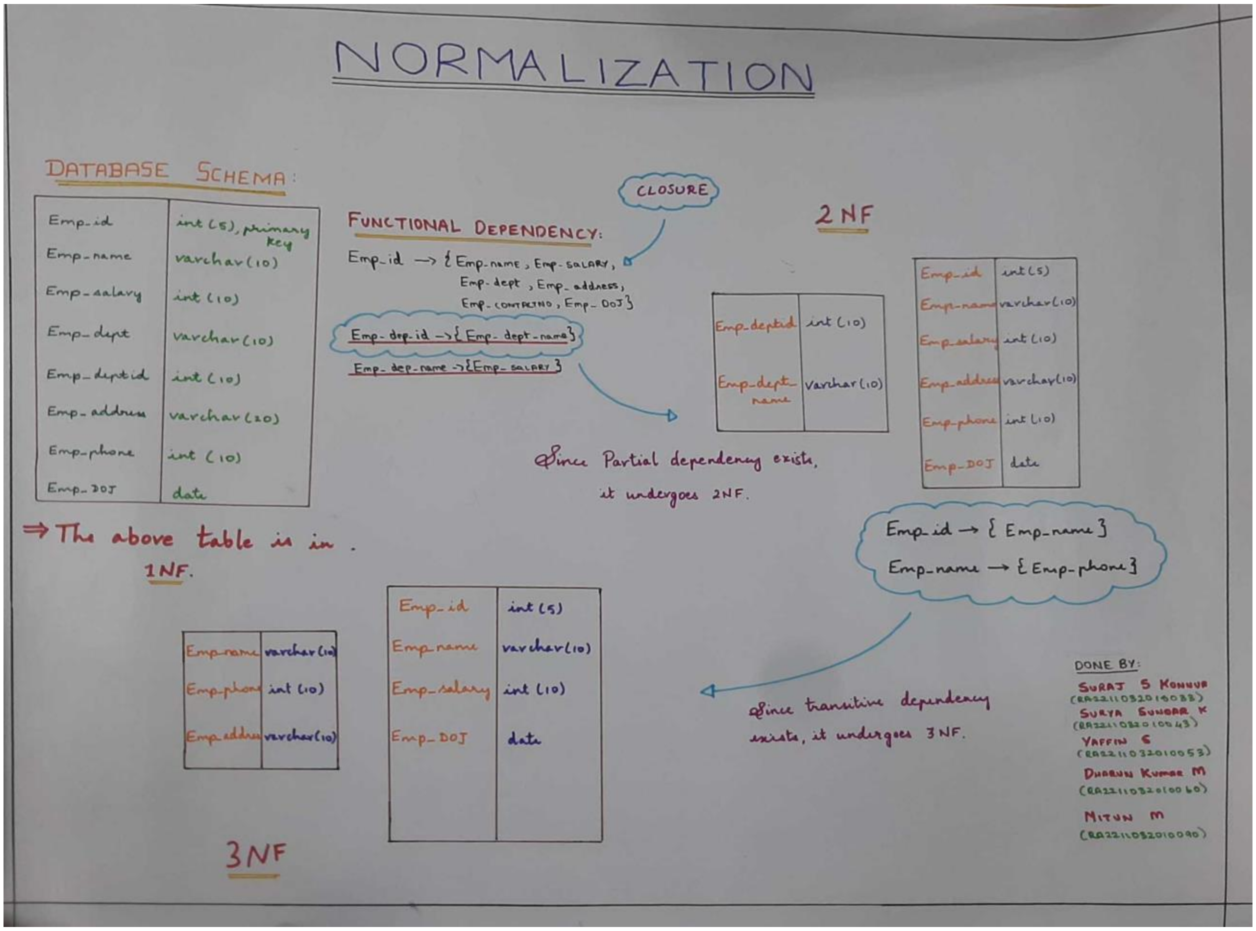
10. Agarwal, R., & Jain, S. (2023). Data Warehousing and Business Intelligence for Cricket Analytics: A Case Study of IPL Matches. International Journal of Data Warehousing and Mining, 19(2), 78-92.

ANNEXURE-1



NORMALIZATION

DATABASE SCHEMA:

Emp_id	int (5), primary key
Emp_name	varchar(10)
Emp_salary	int (10)
Emp_dept	varchar(10)
Emp_deptid	int (10)
Emp_address	varchar(20)
Emp_phone	int (10)
Emp_DOJ	date

⇒ The above table is in . 1NF.

FUNCTIONAL DEPENDENCY:

Emp_id —> { Emp-name, Emp-SALARY, Emp-dept, Emp_address, Emp-CONTACTNO, Emp-DOJ }

CLOSURE

Emp-dep-id -> { Emp-dept-name }

Emp-dep-name -> { Emp-SALARY }

Since Partial dependency exists, it undergoes 2NF.

2NF

Emp_deptid	int (10)
Emp_dept_name	varchar(10)

Emp_id	int(5)
Emp_name	varchar(10)
Emp_salary	int (10)
Emp_address	varchar(10)
Emp_phone	int (10)
Emp_DOJ	date

Emp_id → { Emp_name }

Emp_name → { Emp_phone }

Since transitive dependency exists, it undergoes 3NF.

Emp_name	varchar(10)
Emp_phone	int (10)
Emp_address	varchar(10)

Emp_id	int (5)
Emp_name	varchar(10)
Emp_salary	int (10)
Emp_DOJ	date

3NF

DONE BY:

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ANNEXURE-2

Ex.No. 1	**CREATING DATABASE TABLE**	**Date :3/5/24**

CREATE TABLE

Q1) Create the tables DEPT and EMP as described below

DEPT

Column name	*Data type*	*Description*
DEPTNO	Number	Department number
DNAME	Varchar	Department name
LOC	Varchar	Department Location

EMP

Column name	*Data type*	*Description*
EMPNO	Number	Employee number
ENAME	Varchar	Employee name
JOB	Char	Designation
MGR	Number	Manager's EMP.No.
HIREDATE	Date	Date of joining
SAL	Number	Basic Salary
COMM	Number	Commission
DEPTNO	Number	Department Number

SQL for DEPT table>

```
CREATE TABLE DEPT (

   DEPTNO NUMBER PRIMARY KEY,

   DNAME VARCHAR(50),

   LOC VARCHAR(50)
);
```

SQL for EMP table>

```
CREATE TABLE EMP (
   EMPNO NUMBER PRIMARY KEY,
   ENAME VARCHAR(50),
   JOB CHAR(10),
   MGR NUMBER,
   HIREDATE DATE,
   SAL NUMBER,
   COMM NUMBER,
   DEPTNO NUMBER,
   FOREIGN KEY (DEPTNO) REFERENCES DEPT(DEPTNO)
);
```

Q2) Confirm table creation

SQL> SHOW TABLES;

Q3) List name of the tables created by the user
SQL> SHOW TABLES;

Q4) Describe tables owned by the user
SQL> DESC DEPT;

```
        DESC EMP;
```

Q5) View distinct object types owned by the user

SQL>

```
SELECT DISTINCT table_type
FROM information_schema.tables
WHERE table_name IN ('DEPT', 'EMP') AND table_schema = 'your_database_name';
```

Q6) View tables, views, synonyms, and sequences owned by the user

SQL>

```
SELECT table_name, table_type
FROM information_schema.tables
WHERE table_name IN ('DEPT', 'EMP') AND table_schema = 'your_database_name';
```

Q7) Add new columns COMNT and MISCEL in DEPT table of character type.

SQL >

```
ALTER TABLE DEPT
ADD COLUMN COMNT VARCHAR(255),
ADD COLUMN MISCEL VARCHAR(255);
```

Q8) Modify the size of column LOC by 15 in the DEPT table

SQL >

```
 ALTER TABLE DEPT
MODIFY COLUMN LOC VARCHAR(15);
```

Q9) Set MISCEL column in the DEPT table as unused **SQL >**

```
 ALTER TABLE DEPT
SET UNUSED COLUMN MISCEL;
```

Q10) Drop the column COMNT from the table DEPT

SQL >

```
ALTER TABLE DEPT
DROP COLUMN COMNT;
```

Q11) Drop unused columns in DEPT table

SQL >

```
ALTER TABLE DEPT
DROP UNUSED COLUMNS;
```

Q12) Rename the table DEPT to DEPT12

SQL >

```
ALTER TABLE DEPT RENAME TO DEPT12;
```

Q13) Remove all the rows in the table DEPT12 (Presently no records in DEPT12)

SQL >

```
DELETE FROM DEPT12;
```

Q14) Add some comment to the table DEPT12 and also confirm the inclusion of comment

SQL >

```
ALTER TABLE DEPT12
COMMENT 'This table stores department information.';
```

Q15) Delete the table DEPT12 from the database.

SQL >

```
DROP TABLE DEPT12;
```

Q16) Confirm the removal of table DEPT12 from the database.

SQL >

```
 SELECT table_name
 FROM information_schema.tables
WHERE table_schema = 'your_database_name' AND table_name = 'DEPT12';
```

Ex.No. 2	**Working with Data Manipulation commands**	**Date : 3/5/2024**

Data for EMP table

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	17-DEC-80	800		20
7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30
7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30
7566	JONES	MANAGER	7839	02-APR-81	2975		20
7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	30
7698	BLAKE	MANAGER	7839	01-MAY-81	2850		30
7782	CLARK	MANAGER	7839	09-JUN-81	2450		10
7788	SCOTT	ANALYST	7566	19-APR-87	3000		20
7839	KING	PRESIDENT		17-NOV-81	5000		10
7844	TURNER	SALESMAN	7698	08-SEP-81	1500	0	30
7876	ADAMS	CLERK	7788	23-MAY-87	1100		20
7900	JAMES	CLERK	7698	03-DEC-81	950		30
7902	FORD	ANALYST	7566	03-DEC-81	3000		20
7934	MILLER	CLERK	7782	23-JAN-82	1300		10

Data for DEPT table

DEPTNO	DNAME	LOC
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON

Q1) Insert the rows of DEPT table using syntax (i)

```
SQL> INSERT INTO DEPT (DEPTNO, DNAME, LOC) VALUES (10,
'ACCOUNTING', 'NEW YORK');

INSERT INTO DEPT (DEPTNO, DNAME, LOC) VALUES (20,
'RESEARCH', 'DALLAS');

INSERT INTO DEPT (DEPTNO, DNAME, LOC) VALUES (30, 'SALES',
'CHICAGO');

INSERT INTO DEPT (DEPTNO, DNAME, LOC) VALUES (40,
'OPERATIONS', 'BOSTON');
```

Q2) Insert first & second rows of EMP table using syntax (ii)

```
INSERT INTO EMP (EMPNO, ENAME, JOB, MGR, HIREDATE,
SAL, COMM, DEPTNO)

VALUES (7369, 'SMITH', 'CLERK', 7902, TO_DATE('17-DEC-80',
'DD-MON-YY'), 800, NULL, 20);

INSERT INTO EMP (EMPNO, ENAME, JOB, MGR, HIREDATE, SAL,
COMM, DEPTNO)

VALUES (7499, 'ALLEN', 'SALESMAN', 7698, TO_DATE('20-FEB-81',
'DD-MON-YY'), 1600, 300, 30);
```

Q3) Insert the remaining rows of EMP table using syntax (iii).

```
INSERT INTO EMP (EMPNO, ENAME, JOB, MGR, HIREDATE, SAL,
COMM, DEPTNO)

VALUES (7521, 'WARD', 'SALESMAN', 7698, TO_DATE('22-FEB-81', 'DD-
MON-YY'), 1250, 500, 30);
```

Q4) Create a table MANAGER with the columns *mgr-id, name, salary* and *hiredate*

```
CREATE TABLE MANAGER (
   MGR_ID NUMBER PRIMARY KEY,
   NAME VARCHAR2(50),
   SALARY NUMBER,
   HIREDATE DATE
);
```

Q5) Insert values into the table MANAGER by copying the values from EMP table where the designation of the employee is ‘MANAGER’

```
INSERT INTO MANAGER (MGR_ID,
NAME, SALARY, HIREDATE)
SELECT EMPNO, ENAME, SAL,
HIREDATE
FROM EMP
WHERE JOB = 'MANAGER';
```

Q6) Change the LOC of all rows of DEPT table by ‘NEW YORK’

```
UPDATE DEPT SET LOC = 'NEW YORK';
```

Q7) Change the LOC=’DALLAS’ for deptno=20 in DEPT table.

```
UPDATE DEPT SET LOC = 'DALLAS' WHERE DEPTNO = 20;
```

Q8) Delete the rows from EMP table whose employee name = ‘PAUL’

```
DELETE FROM EMP WHERE ENAME = 'PAUL';
```

Q9) List all the columns and rows of the table DEPT

```
SELECT * FROM DEPT;
```

Q10) List the name of the employee and salary of EMP table

```
SELECT ENAME AS NAME, SAL AS SALARY FROM EMP;
```

Q11) Without duplication, list all names of the department of DEPT table.

```
SELECT DISTINCT DNAME FROM DEPT;
```

Q12) Find out the name of an employee whose EMPNO is 7788. SELECT ENAME FROM EMP WHERE EMPNO = 7788;

Q13) As a copy of DEPT table, create DEPT1 table using select command.

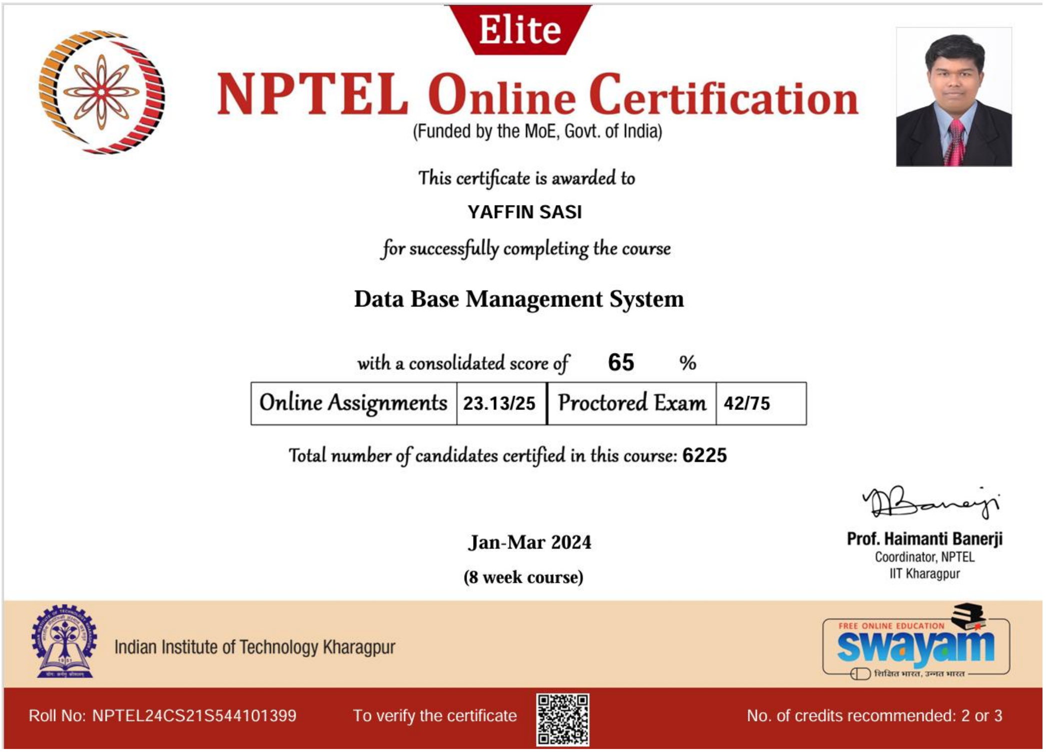
```
CREATE TABLE DEPT1 AS SELECT * FROM DEPT;
```

Q14) List ename and sal of EMP table with the column headings NAME and SALARY

```
SELECT ENAME AS NAME, SAL AS SALARY FROM EMP;
```

ANNEXURE-3

1. S. YAFFIN [RA2211032010053]



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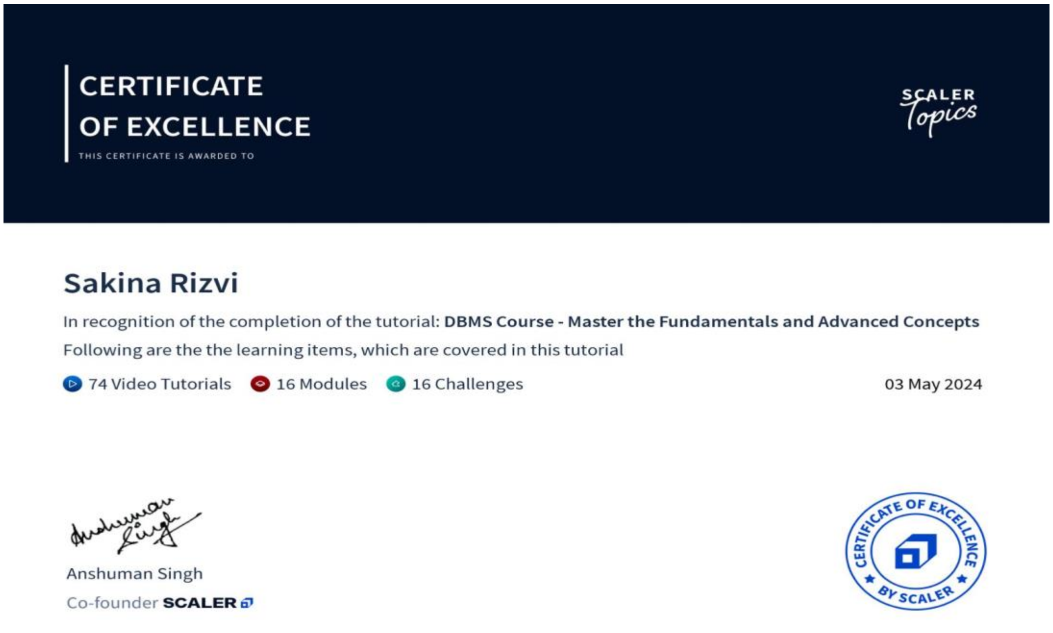
2.SAKINA RIZVI [RA2211032010073]



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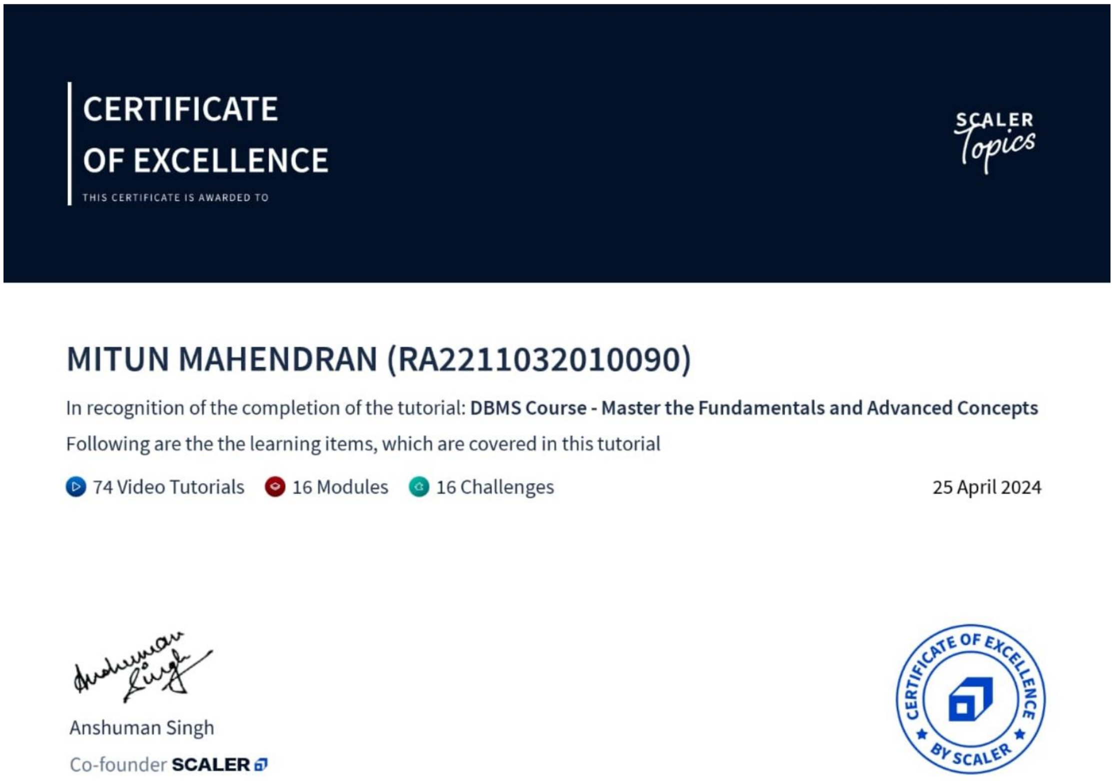
3.MITUN M [RA2211032010090]



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