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Database Management Systems

III B-Tech - 5th Semester



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Cricket Management System By Group (13)

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Aim:

Our DBMS project is based on Cricket Management System. It provides various information about the various teams participating in the World Cup, in which all the major countries 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 have found here.

Introduction:

Database is an organized collection of data. The data is typically organized to model aspects of reality in a way that supports processes requiring information. A DBMS makes it possible for end users to create, read, update, and delete data in a database. The DBMS essentially serves as an interface between the database and end users or application programs, ensuring that data is consistently organized and remains easily accessible.

The DBMS manages three important things: the data, the database engine that allows data to be accessed, locked, and modified and the database schema, which defines the database's logical structure. These three foundational elements help provide concurrency, security, data integrity and uniform administration procedures. The DBMS can offer both logical and physical data independence. That means it can protect users and applications from needing to know where data is stored or having to be concerned about changes to the physical structure of data.

Description

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.
- 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.

Relations:

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).

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

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.

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.

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

Functional Requirements:

1) VIEWER

System must allow users to login if they enter the correct login id and password. The users must be able to see the player details of each player in the database. Scores of each match must be visible. Match date and venue should be displayed on the login if the users seek for it.

System should display the complete roster of a team including the captain and the players playing in the top 11 and the current rank of the team. The details of the coach must also be available to the users. Referees and their details are also important as the players and the viewers want to see the best referees managing their team's match. Each player's statistics should also be available like total runs, number of matches played etc.

System should display data on each match which has been scored in the duration of the entire tournament. System should allow fixtures to be searched and the date should also be available.

BASIC ANALOGY:

- View the website with a browser.
- Login to the website.
- View all teams.
- View all players of a team.
- View all batsmen in the tournament.
- View all bowlers in the tournament.
- View all match reports in a season.
- View statistics of a player (all time).
- View coach details.
- View umpire details.
- View Match details.
- View ranking of each team

View Player information per match:

- a) Number of matches
- b) Total runs
- c) Total wickets

View all match details:

- i. Team 1
- ii. Team 2
- iii. Umpire
- iv. Winner
- v. Date
- vi. Time
- vii. Stadium
- viii. Rank of teams after match

2) ADMINISTRATOR

Administrator is in charge of creating the website which is used to access the database. Administrator has all the privileges of the user but has the authority to add and remove data from the database which the user cannot do.

Administrator is responsible for creating different user accounts and assigning the id and password. Administrators are the one who generate the fixtures and update them in the database. They should be allowed to enter the team's name of home and away teams. He should have the authority to enter and modify the match details like time and venue in case the need to be changed.

If any player has been punished for bad behaviour or other reasons and cannot play in the World Cup anymore the administrator should be able to delete the data from the database. The rank of every team must keep being modified after each match. After a team is eliminated or disqualified the administrator should be able to delete the entire team's record.

BASIC ANALOGY:

- Create website.
- Generate login ID for viewer.
- Design website.
- Display different menus.
- Create World Cup.
- Display Team Name.
- Display Team Captain.
- Display Team Squad.

View Player information per match:

- a) Number of matches
- b) Total runs
- c) Total wickets

REMOVAL OF OLD DATA:

- i. If any team gets disqualified, then their data needs to be removed from the database.
- ii. If a player gets injured during the World Cup and is unable to play further, then their data needs to be removed from the database.
- iii. If any match gets cancelled due to unforeseen circumstances, then the particular match details should be removed.

MODIFICATION OF DATA:

- i. After every match the existing ranks of every team should be modified.
- ii. After every match, the statistics of every player should be updated.
- iii. Due to unfavourable weather conditions, a match might get delayed. Hence, the match timings need to be changed.

RETRIEVAL OF DATA:

i) View information of every Team:

Before the start of a new match, we have to retrieve the Team record like:

- a) Team Name
- b) Number of Batsman
- c) Number of Bowlers
- d) Wicketkeeper
- e) Number of Wins
- f) Number of Losses
- g) Names of Players

ii) View information of every Match:

After every match, we have to retrieve the Match details like:

- a) First Team Name
- b) Second Team Name
- c) Umpire
- d) Winner
- e) Loser

iii) View Score Board:

After every match, we have to retrieve the ranking order of teams:

- a) Rank of each team
- b) Team name

iv) View the captain of each team:

During the toss, we need to retrieve the data of the captain

- a) Name of captain
- b) Number of wins under his captaincy
- c) Years of captaincy

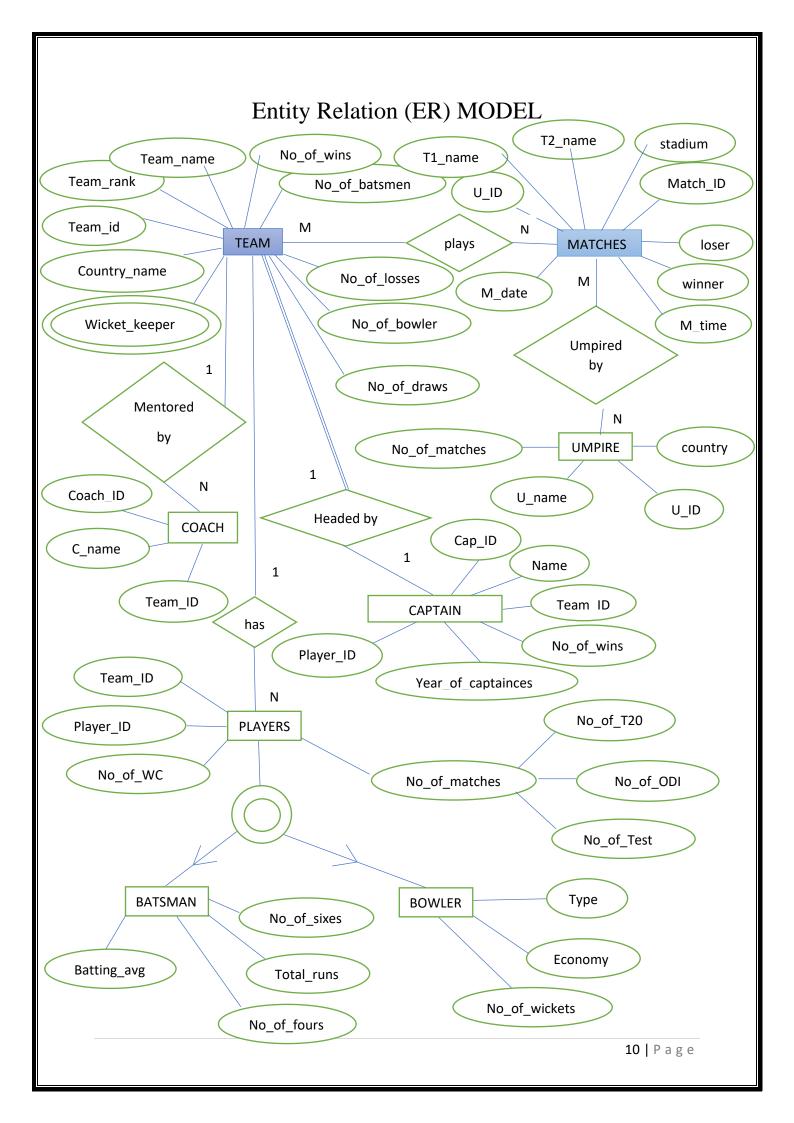
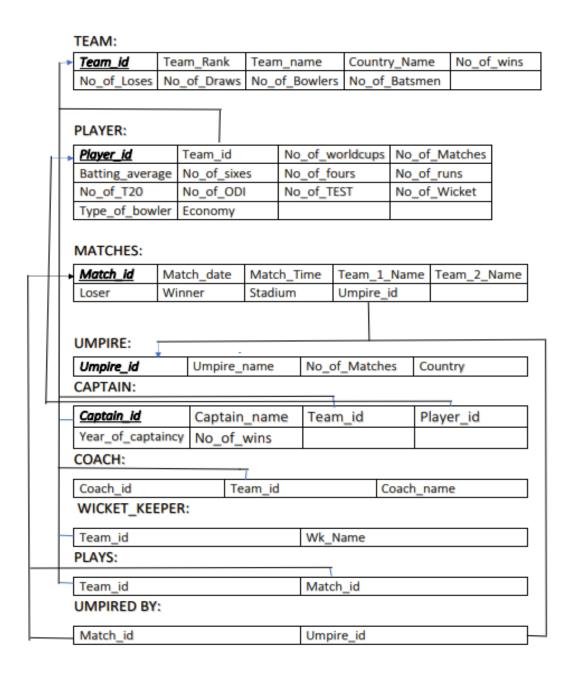


TABLE DESCRIPTION:

TABLES

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

SCHEMA REPRESENTATION:



NORMALIZATION:

1st Normal Form:

The database that we have created has no multivalued attributes,

So we can say that our Database is 1 NF.

2nd Normal Form:

Rules for 2 NF is that:

- Database should be in 1 Normal Form.
- The Non-Prime attributes of each entity should depend on the candidate set of the entity.

By looking into our database, we can say that it is already in normalized form of 2 NF and no modification required.

3rd Normal Form:

The rules for 3 Normal Form are:

- The data base is already in 2 Normal Form.
- There should not be Transitive Functional Dependency.

The database is already in 3 Normal Form

SQL:

TABLE TEAM:

```
mysql> use cricketmanagementsystem
Database changed
mysql> create table TEAM(
    -> team_id int primary key,
    -> team_rank int,
    -> team_name varchar(20),
    -> country_name varchar(20),
    -> no_of_wins int,
    -> no_of_loses int,
    -> no_of_draws int,
    -> no_of_bowlers int,
    -> no_of_batsmans int);
Query OK, 0 rows affected (0.03 sec)
```

Field	Туре	Null	Key	Default	Extra
team_id	int	NO	PRI	NULL	
team_rank	int	YES		NULL	l
team_name	varchar(20)	YES		NULL	l
country_name	varchar(20)	YES		NULL	
no_of_wins	int	YES		NULL	
no_of_loses	int	YES		NULL	
no_of_draws	int	YES		NULL	l
no_of_bowlers	int	YES		NULL	
no_of_batsmans	int	YES		NULL	

TABLE WICKET KEEPER:

```
mysql> create table MICKET_KEEPER(
-> team_id int,
-> wk_name varchar(30));
Query OK, 0 rows affected (0.03 sec)

mysql> alter table MICKET_KEEPER
-> add FOREIGN KEY (team_id) REFERENCES team(team_id));
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near ')
' at line 2
mysql> alter table MICKET_KEEPER
-> add FOREIGN KEY (team_id) REFERENCES team(team_id);
Query OK, 0 rows affected (0.08 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

TABLE UMPIRE:

```
mysql> create table UMPIRE(
   -> umpire_id int primary key,
   -> umpire_name varchar(30),
   -> no_of_matches int,
   -> country varchar(20)
   -> );
Query OK, 0 rows affected (0.03 sec)
mysql> desc UMPIRE;
Field
                               Null | Key | Default | Extra
                 Type
 umpire_id
                  int
                                NO
                                       PRI
                                             NULL
 umpire_name
                                YES
                                             NULL
                  varchar(30)
                                YES
                                             NULL
 no_of_matches
                  int
                               YES
                                             NULL
 country
                 varchar(20)
4 rows in set (0.00 sec)
```

TABLE PLAYER:

```
mysql> create table PLAYER(
    -> player_id int primary key,
    -> team_id int,
    -> no_of_worldcup int,
    -> number_of_matches int,
    -> batting_average int,
    -> no_of_sixes int,
    -> no_of_fours int,
    -> no_of_tours int,
    -> no_of_toutalruns int,
    -> no_of_t20 int,
    -> no_of_t20 int,
    -> no_of_t20 int,
    -> no_of_buickets int,
    -> no_of_wickets int,
    -> type_of_bowler varchar(20),
    -> economy int);
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> desc PLAYER;
  Field
                                            | Null | Key | Default | Extra |
                          | Type
  player_id
                            int
                                              NO
                                                        PRI
                                                               NULL
  team_id
                            int
                                               YES
                                                                NULL
  no_of_worldcup
                            int
                                                                NULL
  number_of_matches
                            int
                                                                NULL
  batting_average
                            int
                                              YES
                                                               NULL
  no_of_sixes
                            int
                                               YES
                                                               NULL
  no_of_sixes
no_of_fours
no_of_totalruns
no_of_t20
no_of_odi
no_of_test
no_of_wickets
type_of_bowler
                            int
                                               YES
                                                               NULL
                                              YES
                            int
                                                               NULL
                            int
                                              YES
                                                               NULL
                            int
                                              YES
                                                               NULL
                            int
                                              YES
                                                               NULL
                            int
                                                               NULL
                                              YES
                            varchar(20)
                                                               NULL
                                              YFS
                            int
  economy
                                              YES
                                                               NULL
14 rows in set (0.00 sec)
```

TABLE COACH:

```
mysql> create table COACH(
-> coach_id int primary key,
-> team_id int,
-> coach_name varchar(30)):
-> );

ERROR 1864 (42800): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near ':

)' at line 4
mysql> create table COACH(
-> coach_id int primary key,
-> team_id int,
-> coach_name varchar(30));

Query OK, 0 rows affected (0.02 sec)
```

```
mysql> desc coach;
 Field
               Type
                             Null
                                   | Key
                                           Default
                                                      Extra
  coach_id
               int
                              NO
                                     PRI
                                            NULL
  team_id
               int
                              YES
                                            NULL
               varchar(30)
                                            NULL
  coach_name
                              YES
3 rows in set (0.00 sec)
```

TABLE CAPTAIN:

```
mysql> create table CAPTAIN(
-> captain_id int primary key,
-> captain_name varchar(30),
-> team_id int,
-> player_id int,
-> year_of_captaincy int,
-> no_of_wins int);
Query OK, 0 rows affected (0.03 sec)
mysql> desc CAPTAIN;
 | Field
                                                  Туре
                                                                               Null
                                                                                                                Default | Extra
                                                 varchar(30)
int
int
    captain_id
captain_name
                                                                                                                NULL
NULL
                                                                                 NO
YES
YES
YES
YES
                                                                                                  PRI
    team_id
player_id
                                                                                                                NULL
NULL
NULL
    year_of_captaincy
no_of_wins
                                                   int
6 rows in set (0.00 sec)
```

TABLE MATCHES:

```
mysql> desc matches;
  Field
                                           | Null | Key | Default | Extra |
                        Туре
  match_id
match_date
match_time
team_1_name
                                                       PRI
                                                                NULL
                        int
                                                                 NULL
                       timestamp
varchar(30)
varchar(30)
varchar(30)
varchar(30)
                                             YES
                                                                 NULL
                                                                 NULL
                                            YES
YES
                                                                NULL
NULL
   team_2_name
  loser
                                            YES
YES
YES
                                                                 NULL
  stadium
                       varchar(30)
int
                                                                 NULL
  umpire_id
                                                                 NULL
9 rows in set (0.00 sec)
```

TABLE PLAYS:

```
mysql> create table PLAYS(
    -> team_id int,
    -> match_id int);
Query OK, 0 rows affected (0.03 sec)

mysql> alter table PLAYS
    -> add FOREIGN KEY (team_id) REFERENCES team(team_id);
Query OK, 0 rows affected (0.07 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> alter table PLAYS
    -> add FOREIGN KEY (match_id) REFERENCES matches(match_id);
Query OK, 0 rows affected (0.09 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

TABLE UMPIRED_BY:

CODE TO INSERT VALUES TO TABLE:

TABLE TEAM:

insert into team values ('IND1221', 1, 'MEN IN BLUE','INDIA', 5, 1, 0, 6, 7); Insert into team values ('AUS2174', 4, 'KANGAROO','AUSTRAILA', 3, 3, 0, 5, 6); Insert into team values ('SA5412', 3, 'PROTEA','SOUTH AFRICA', 3, 2, 1, 8, 5); Insert into team values ('NZ5687', 2, 'BLACK CAPS','NEW ZEALAND', 4, 2, 0, 6, 7);

Insert into team values ('BAN9852', 5, 'TIGERS', 'BANGLADESH', 2, 4, 0, 7, 7);

TEAM_ID	TEAM_RANK	TEAM_NAME	COUNTRY_NAME	NO_OF_WINS	NO_OF_LOSES	NO_OF_DRAWS	NO_OF_BOWLERS	NO_OF_BATSMANS
ND1221		MEN IN BLUE	INDIA					
WS2174		KANGAROO	AUSTRAILA					
A5412		PROTEA	SOUTH AFRICA				8	
IZ5687	2	BLACK CAPS	NEW ZEALAND					
BAN9852		TIGERS	BANGLADESH					

UMPIRE VALUES:

insert into UMPIRE values ('UMP41002', 'Kumar Dharmasena', 103, 'Sri Lanka'); insert into UMPIRE values ('UMP74101', 'Aleem Dar', 207, 'Pakistan'); insert into UMPIRE values ('Ump52410', 'Anil Chaudhary', 19, 'India'); insert into UMPIRE values ('UMP85201', 'Ian Gould', 140, 'England'); insert into UMPIRE values ('UMP55200', 'Tony Hill', 96, 'New Zealand');

SQL> select * from UMPIRE;			
JMPIRE_ID	UMPIRE_NAME	NO_OF_MATCHES	COUNTRY
JMP41002	Kumar Dharmasena	103	Sri Lanka
JMP74101	Aleem Dar	207	Pakistan
Jmp52410	Anil Chaudhary	19	India
JMP85201	Ian Gould	140	England
JMP55200	Tony Hill	96	New Zealand

COACH VALUES:

```
insert into COACH values( 'CH417', 'IND1221', 'RAVI SHASTRI' ); insert into COACH values( 'CH140', 'AUS2174', 'JUSTIN LANGER' ); insert into COACH values( 'CH223', 'SA5412', 'OTTIS GIBSON' ); insert into COACH values( 'CH398', 'NZ5687', 'GARY STEAD' ); insert into COACH values( 'CH748', 'BAN9852', 'RUSSEL DOMINGO' );
```

SQL> select * from CC	ACH;	
COACH_ID	TEAM_ID	COACH_NAME
CH417	IND1221	RAVI SHASTRI
CH140	AUS2174	JUSTIN LANGER
CH223	SA5412	OTTIS GIBSON
CH398	NZ5687	GARY STEAD
CH748	BAN9852	RUSSEL DOMINGO

CAPTAIN VALUES:

insert into captain values ('CAP11452', 'MS DHONI', 'IND1221', 'PLR44567', 4,56);

insert into captain values ('CAP21478', 'DALE STEYN', 'SA5412', 'PLR10235', 7,74);

insert into captain values ('CAP30214', 'MICHAEL CLARKE', 'AUS2174', 'PLR74138', 9,100);

insert into captain values ('CAP14789', 'TAMIM IQBAL', 'BAN9852', 'PLR89562', 2,20');

insert into captain values ('CAP36957', 'ROSS TAYLOR', 'NZ5687', 'PLR957417', 5,85);

SQL> select * from captain;				
		TEAM_ID	PLAYER_ID	YEAR_OF_CAPTAINCY
IO_OF_WINS				
AP11452 56	MS DHONI	IND1221	PLR44567	
AP21478 74	DALE STEYN	SA5412	PLR10235	
AP30214 100	MICHAEL CLARKE	AUS2174	PLR74138	
AP14789 20	TAMIM IQBAL	BAN9852	PLR89562	
AP36957 85	ROSS TAYLOR	NZ5687	PLR957417	

MATCHES VALUES:

insert into MATCHES values ('MAT101',to_date('12-03-2011','dd-mmyyyy'),to_timestamp('15:30','hh24:mi'),'India','Bangladesh','Bangladesh','India','Fer oz Shah Kotla','UMP55200');

insert into MATCHES values ('MAT201',to_date('15-03-2011','dd-mmyyyy'),to_timestamp('9:30','hh24:mi'),'England','Australia','England','Australia','Ed en Gardens','UMP41002');

insert into MATCHES values ('MAT301',to_date('21-03-2011','dd-mm-yyyy'),to_timestamp('11:30','hh24:mi'),'Sri Lanka','Bangladesh','Bangladesh','Sri Lanka','M.A. Chidambaram','UMP74101');

insert into MATCHES values ('MAT401',to_date('23-03-2011','dd-mm-yyyy'),to_timestamp('15:30','hh24:mi'),'New Zealand','South Africa','South Africa','New Zealand','Sardar Patel','UMP85201');

insert into MATCHES values ('MAT501',to_date('26-03-2011','dd-mmyyyy'),to_timestamp('8:30','hh24:mi'),'England','India','England','India','Wankhede','Ump524 10');

SQL> select * from M	ATCHES;					
NATCH_ID	MATCH_DAT	MATCH_TIME			TEAM_1_NAME	
FEAM_2_NAME		LOSER	WINNER	STADIUM		UMPIRE_ID
AT101 Bangladesh	12-MAR-11	01-0CT-19 03.30.00 PM Bangladesh	India	Feroz Shah Ko	India tla	UMP55200
MAT301 Bangladesh	21-MAR-11	01-OCT-19 11.30.00 AM Bangladesh	Sri Lanka	M.A. Chidamba	Sri Lanka ram	UMP74101
4AT401 South Africa		01-OCT-19 03.30.00 PM South Africa	New Zealand	Sardar Patel	New Zealand	UMP85201
4AT501 India	26-MAR-11	01-OCT-19 08.30.00 AM England	India	Wankhede	England	Ump52410
4AT201 Australia	15-MAR-11	01-0CT-19 09.30.00 AM England	Australia	Eden Gardens	England	UMP41002

PLAYER VALUES:

insert into PLAYER values ('PLR17410', 'IND1221', 2, 13, 58,7,24,800,74,120,20,1,'medium',3.2);

insert into PLAYER values ('PLR74203', 'AUS2174', 1, 6, 67, 10,39,463,41,210,140 ,1,'slow',8.5);

insert into PLAYER values ('PLR45987', 'SA5412', 3, 4, 99, 4, 47,985, 24,63,65,1,'medium-slow',11.2);

insert into PLAYER values ('PLR20147', 'NZ5687', 1, 12, 12, 1, 3,85, 52, 10,74,1,'legspin',18.3);

insert into PLAYER values ('PLR65200', 'BAN9852', 2, 9, 4, 0,1,21,77, 30,2,1,'fast',17.3);

LAYER_ID			TEAM_II			NO_OF_	WORLDCUPS	NUMBER_OF_MATCHES	5 BATT	ING_AVE	RAGE I	IO_OF_SIXES	NO_OF_FOUR
O_OF_TOTA	LRUNS			NO_OF_TEST	NO_OF_WICKETS					NOMY			
LR17410	800		IND1221	1 20		mediu			3				
LR74203	463		AUS2174 210	140		slow							
LR45987	985	24	SA5412 63		1	mediu	am-slow		1		99		4
LR20147			NZ5687 10		1	legsp	1 oin						
LR65200			BAN9853 30			fast							

UMPIRED BY VALUES:

insert into Umpired_by values('MAT501','UMP55200'); insert into Umpired_by values('MAT301','Ump52410'); insert into Umpired_by values('MAT101','UMP41002'); insert into Umpired_by values('MAT401','UMP74101'); insert into Umpired_by values('MAT201','Ump52410');

PLAYS VALUES:

```
insert into Plays values ('IND1221','MAT101'); insert into Plays values ('AUS2174','MAT201'); insert into Plays values ('BAN9852','MAT301'); insert into Plays values ('NZ5687','MAT401'); insert into Plays values ('IND1221','MAT501');
```

WICKET_KEEPER VALUES:

```
insert into WICKET_KEEPER values( 'IND1221','MS Dhoni' ); insert into WICKET_KEEPER values( 'IND1221','Dinesh Kartik' ); insert into WICKET_KEEPER values( 'AUS2174','Tim Lee' ); insert into WICKET_KEEPER values( 'AUS2174','Peter Hegward' ); insert into WICKET_KEEPER values( 'AUS2174','Hefer Kingsly' );
```

Conclusion:

Cricket management system allows the user to check the profile of any player as the DBMS helps in storing and retrieving the data from the databases. Many operations can be performed from the data available on the database such as analysing the form of a player in recent, past times. It shows how well the player is been with his/her game throughout the selected time period. In real world, during IPL Auctions, Many analysts use data from databases and perform analysis and come to conclusion whether the player is fit for their franchise before actually buying the player in the auction.