

# Sports League Database

**Submitted By**

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Date:

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## **1.INTRODUCTION**

Database Management is an important aspect of data processing. It involves, several data models evolving into different DBMS software packages. These packages demand certain knowledge in discipline and procedures to effectively use them in data processing applications. We need to understand the relevance and scope of Database in the Data processing area. The DBMS helps create an environment in which end user have better access to more and better managed data than they did before the DBMS become the data management standard. A database management system, therefore, is a combination of hardware and software that can be used to set up and monitor a database and can manage the updating and retrieval of database that has been stored in it. We are using ORACLE for our project. We are creating the detailed design for the FRANCHISE CRICKET LEAGUE. Problem emphasises on the sports league which has a great scope in future.

## **2.PROBLEM DEFINITION:**

Our aim is to create a database for a Franchise Cricket League,improve it with our design. We also aim to produce and execute the queries on our database. This model can be used in any sports which has this kind of franchise form of tournament.

### **2.1. SCOPE:**

Since,we have focussed on Franchise Cricket league which is quite trending all over the world. With lots of popularity comes lots of data. It is very important to save this data in a proper manner in some database. So, our design comes into play, as we provide database which will be efficient and easy to use. We will try to execute all types of queries , so that none of the dimensions are left untouched. It's not even limited to a single sport, slight change in the database can make it for other sports too. This adaptability is one of the best features and will help in the future times.

### **2.2. EXCLUSIONS:**

We have excluded the auction of players part from our design , to keep it focussed on the main topic and remove the complexity of design. We have also excluded of any player playing for more than one franchise,to reduce the complexity and as it is Cricket league so no such instance will occur.

### **2.3. ASSUMPTIONS:**

- 1.We have figured out entities as FRANCHISE,TEAM,MATCH,UMPIRE,PLAYER.
- 2.Relationships include make,owns,has,play,presides,participating.
- 3.TEAM has been specialized as HOST TEAM and GUEST TEAM.
- 4.PLAYER has been specialized as BATSMAN,BATSMAN and BOWLER.
5. ER model is aggregated as FRANCHISE CRICKET LEAGUE.
6. Multivalued attributes contact is used in FRANCHISE .
- 7.Derived attribute age is used in PLAYER.
- 8.participating is a M:N relationship,whereas other relations like has ,make,play and presides are 1:N relationship.

### **3.REQUIREMENT ANALYSIS:**

#### **ENTITIES:**

FRANCHISE: This entity is used for describing the franchise that buy players makes team.

TEAM: This is comprised of players and made by the franchise. Teams play matches.

HOST TEAM and GUEST TEAM are specialized forms of Team.

MATCH: It is played between teams. It is the main event of the model.

UMPIRE: This entity presides in a match.

PLAYER: This entity describes the players and it participates in matches.

BATSMAN,BOWLER and ALL ROUNDER are specialized forms of player.

#### **RELATIONSHIPS:**

make: It is a relationship between FRANCHISE and TEAM. It is a one to one relationship.It has a cardinality of 1:1.

owns: It is a relationship between FRANCHISE and PLAYER. It is a one to many relationship.It has a cardinality of 1:N.

has: It is a relationship between TEAM and PLAYER. It is a one to many relationship.It has a cardinality of 1:N.

play: It is a relationship between TEAM and MATCH. It is a two to many relationship.It has a cardinality of 2:N.

presides: It is a relationship between UMPIRE and MATCH. It is a one to many relationship.It has a cardinality of 1:N.

participating: It is a relationship between PLAYER and MATCH. It is a many to many relationship.It has a cardinality of M:N.

#### **ATTRIBUTES:**

FRANCHISE(F\_ID,F\_NAME,F\_CONTACT,F\_ADDRESS,EXPERIENCE,F\_PURSE\_VALUE  
)

TEAM(T\_ID,T\_NAME)

MATCH(M\_DATE,M\_NO,M\_LOC,M\_TYPE,M\_WINNER)

UMPIRE(U\_ID,U\_NAME,U\_EXPERIENCE,U\_COUNTRY)

PLAYER(P\_ID,P\_NAME,P\_COUNTRY,P\_DOB,P\_AGE,P\_EXPERIENCE)

BATSMAN(TOP SCORE,STRIKE RATE)

BOWLER(MOST WICKETS,ECONOMY)

ALL ROUNDER(TOP SCORE,STRIKE RATE,ECONOMY,MOST WICKETS)

#### **CONSTRAINTS:**

##### **PRIMARY KEY CONSTRAINTS:**

<b>ENTITY</b>	<b>PRIMARY KEY</b>
---------------	--------------------

TEAM	T_ID
FRANCHISE	F_ID
MATCH	M_NO
UMPIRE	U_ID
PLAYER	P_ID

#### **REFERENTIAL INTEGRITY CONSTRAINTS:**

F\_ID is the referential integrity constraint of PLAYER entity.

T\_ID is the referential integrity constraint of PLAYER entity.

U\_ID is the referential integrity constraint of MATCH entity.

P\_ID,M\_NO are the referential integrity constraint of participating relation.

HT\_ID and GT\_ID are the referential integrity constraint of MATCH entity.

#### **EER FEATURES:**

Specializations used:

Player is specialized as Batsman,Bowler and All-Rounder

Team is Specialized as Host Team and Guest Team.

Aggregation used:

Whole ER design is aggregated as Franchise Cricket League.

## **4. DESIGN**

### **4.1 TECHNICAL ENVIRONMENT**

Technical requirements :

Design :

DIA software - ER and relational model

And normalization ( refinement of schema)

Hardware and software requirements :

Operating System : Windows 7/8/10

Language : Sql (DDL,DML )

Software tools : Dia for making the ER and relational model

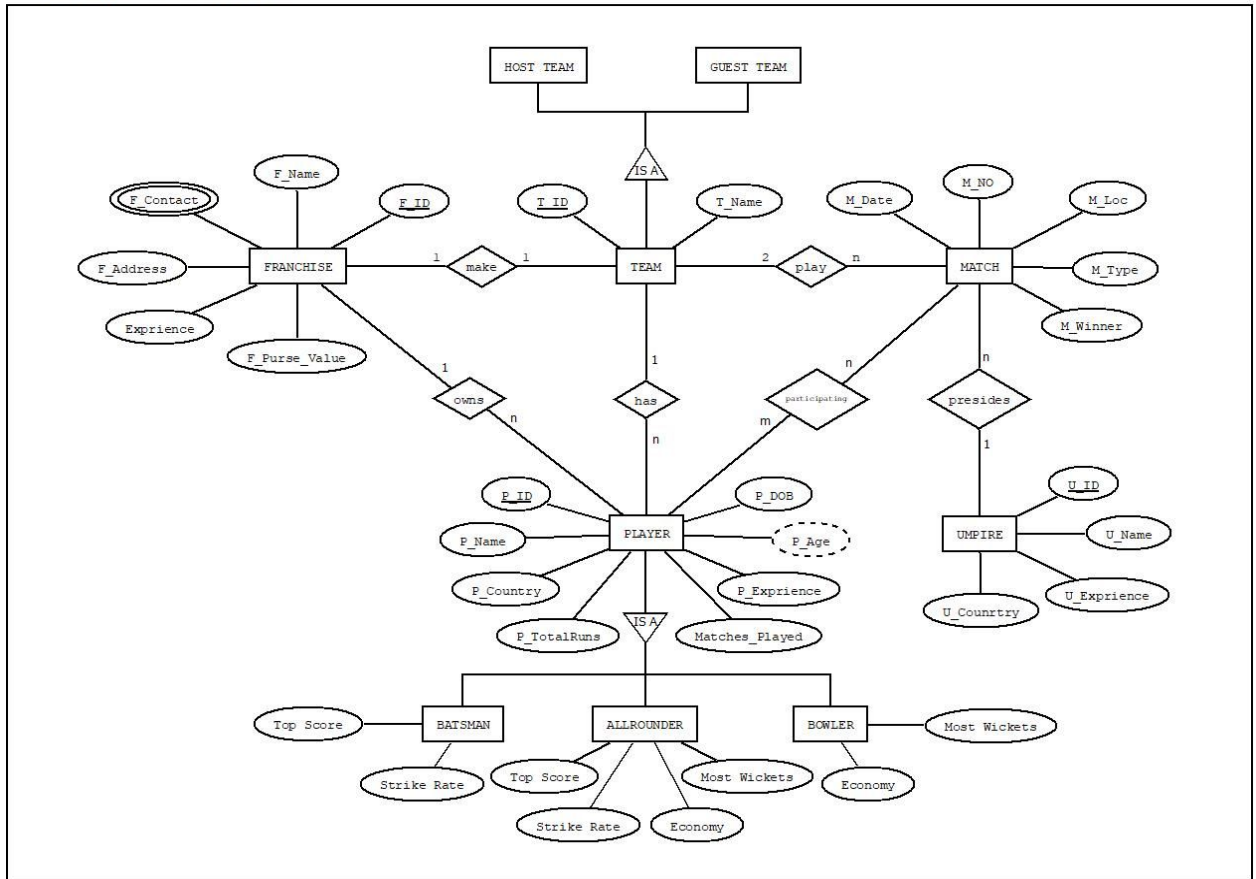
Oracle 10g

### **4.2 ENTITY RELATIONSHIP MODEL (ER MODEL)**



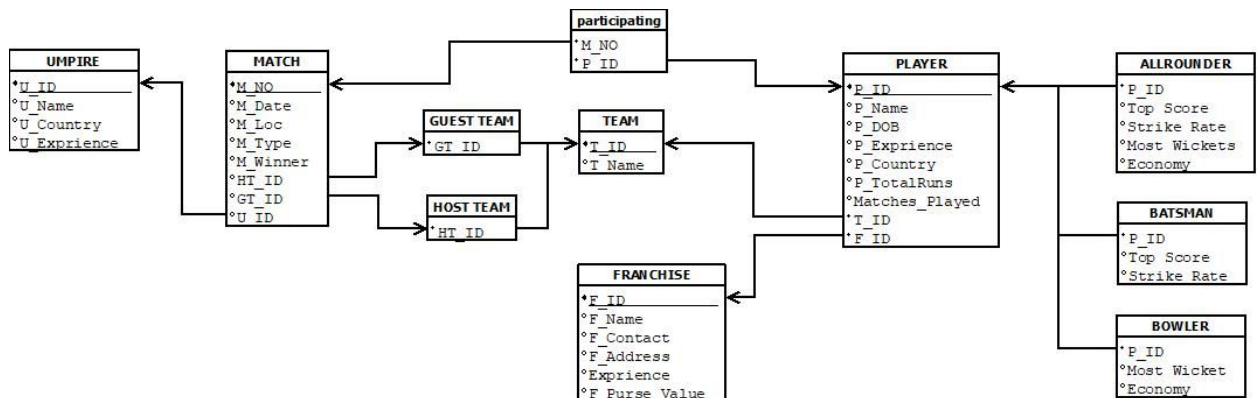
## EER DIAGRAM

FRANCHISE CRICKET LEAGUE



## RELATIONAL SCHEMA

The Relational Model we have designed for the Franchise Cricket League is as shown below:



### 4.3 REFINEMENT OF SCHEMA (NORMALIZATION)

#### For Match Table:

M\_NO -> M\_Date, M\_Loc, M\_Type, M\_Winner, HT\_ID, GT\_ID, U\_ID

M\_Date -> M\_Winner                      \*assuming a single match a day

Prime Attribute: M\_NO

Non Prime Attribute: M\_Date, M\_Loc, M\_Type, M\_Winner, HT\_ID, GT\_ID, U\_ID

Since all the values in the table are atomic. So, it's in 1NF.

Since all non prime attribute is fully functionally dependent on prime attribute. So, it's in 2NF.

Since M\_date(non prime) determines M\_Winner(non prime) So, It's not in 3NF. We need to perform a dependency preserving lossless decomposition.

MATCH(M\_NO, M\_Date, M\_Loc, M\_Type, M\_Winner, HT\_ID, GT\_ID, U\_ID)

- MATCH1(M\_NO, M\_Loc, M\_Type, M\_Date, HT\_ID, GT\_ID, U\_ID)
- MATCH2(M\_Date, M\_Winner)

Now, It's in 3NF as well as in BCNF.

#### For PLayer Table:

PLAYER(P\_ID, P\_Name, P\_DOB, P\_Exprience, P\_Country, P\_TotalRuns, MatchesPlayed, T\_ID, F\_ID)

P\_ID -> P\_Name, P\_Exprience, P\_Country, P\_TotalRuns, MatchesPlayed, T\_ID, F\_ID

Prime Attribute: P\_ID

Non Prime Attribute: P\_Name, P\_Exprience, P\_Country, P\_TotalRuns, MatchesPlayed, T\_ID, F\_ID

- Since all the values in the table are atomic. So, it's in 1NF.
- Since all non prime attribute is fully functionally dependent on prime attribute. So, it's in 2NF.
- Since No non prime attribute is determining any other non prime attribute. So, It's in 3NF.

All other tables can also be decomposed to get the best possible normalized form.

### 5. IMPLEMENTATION

Table creation ,insertion of data and Query execution is shown below

## 5.1 TABLE CREATION

```
create table team(t_id varchar(20) primary key not null,t_name varchar(20) not null);
create table umpire(u_id varchar(20) primary key not null, u_name varchar(20),u_country
varchar(20),u_experience number(3));
```

```
create table match(m_no varchar2(20)primary key not null,m_date date,m_location varchar2(20)
not null,m_type varchar2(20)not null,m_winner varchar(20),ht_id varchar(20) references
team(t_id),gt_id varchar(20) references team(t_id),u_id varchar(20) references umpire(u_id));
```

```
create table franchise(f_id varchar(20) primary key not null, f_name varchar(20),f_contact
number(10),f_address varchar(20),experience number(2),f_purse_value number(4,2));
```

```
create table player(p_id varchar2(20)primary key not null, p_name varchar2(20)not null, p_dob
date, p_experience number(10)not null,p_country varchar2(20) not null,p_totalruns
number(4),matches_played number(3),t_id varchar(20) references team(t_id), f_id varchar2(20)
references franchise(f_id));
```

```
create table allrounder(p_id varchar(20) references player(p_id),topscore number(3),strike_rate
number(7,3),most_wickets number(2),economy number(6,2));
create table batsman(p_id varchar(20) references player(p_id),topscore number(3),strike_rate
number(7,3));
```

```
create table bowler(p_id varchar(20) references player(p_id),most_wickets number(2),economy
number(6,2));
```

```
create table participating(m_no varchar(20) references match(m_no),p_id varchar(20) references
player(p_id));
```

## 5.2 DATA INSERTION

```
insert into team values('t001','CR');
insert into team values('t002','SBG');
insert into team values('t003','MTC');
insert into team values('t004','TW');
```

```
select * from team;
```

T_I D	T_NAM E
----------	------------

t001	CR
t002	SBG
t003	MTC
t004	TW

```

insert into umpire values('u001','TIM','AUS',4);
insert into umpire values('u002','RAVI','IND',7);
insert into umpire values('u003','COTLER','NWZ',1);
insert into umpire values('u004','JOS','ENG',11);
insert into umpire values('u005','MORKEL','SA',6);
insert into umpire values('u006','SALEVA','SRILANKA',2);
insert into umpire values('u007','ALIM','PAK',6);
insert into umpire values('u008','COOK','ENG',9);

```

**select \*from umpire;**

U_I D	U_NAM E	U_COUNTR Y	U_EXPERIEN CE
u001	TIM	AUS	4
u002	RAVI	IND	7
u003	COTLER	NWZ	1
u004	JOS	ENG	11
u005	MORKEL	SA	6
u006	SALEVA	SRILANKA	2
u007	ALIM	PAK	6
u008	COOK	ENG	9

```

insert into match values('m001','20-MAR-2019','Chennai','League','t001','t001','t002','u003');
insert into match values('m002','22-MAR-2019','Bengaluru','League','t002','t002','t001','u008');
insert into match values('m005','25-MAR-2019','Mumbai','League','t002','t003','t002','u001');
insert into match values('m007','27-MAR-2019','Hyderabad','League','t002','t004','t002','u002');
insert into match values('m008','29-MAR-2019','Hyderabad','League','t001','t004','t001','u004');
insert into match values('m009','03-APR-2019','Bengaluru','League','t001','t001','t002','u005');
insert into match values('m0011','07-APR-2019','Mumbai','League','t001','t003','t001','u007');
insert into match values('m0015','11-APR-2019','Chennai','League','t002','t001','t002','u006');
insert into match values('m0017','13-APR-2019','Mumbai','League','t003','t003','t004','u003');
insert into match values('m0021','19-APR-2019','Bengaluru','League','t002','t002','t004','u008');
insert into match values('m0025','25-APR-2019','Chennai','Final','t002','t001','t002','u005');

```

**select \* from match;**

M_NO	M_DATE	M_LOCATIO N	M_TYP E	M_WINNE R	HT_I D	GT_I D	U_I D
m001	20-MAR-19	Chennai	Leagu e	t001	t001	t002	u00 3
m002	22-MAR-19	Bengaluru	Leagu e	t002	t002	t001	u00 8
m005	25-MAR-19	Mumbai	Leagu e	t002	t003	t002	u00 1
m007	27-MAR-19	Hyderabad	Leagu e	t002	t004	t002	u00 2
m008	29-MAR-19	Hyderabad	Leagu e	t001	t004	t001	u00 4
m009	03-APR-19	Bengaluru	Leagu e	t001	t001	t002	u00 5
m0011	07-APR-19	Mumbai	Leagu e	t001	t003	t001	u00 7
m0015	11-APR-19	Chennai	Leagu e	t002	t001	t002	u00 6
m0017	13-APR-19	Mumbai	Leagu e	t003	t003	t004	u00 3
m0021	19-APR-19	Bengaluru	Leagu e	t002	t002	t004	u00 8
m0025	25-APR-19	Chennai	Final	t002	t001	t002	u00 5

```

insert into franchise values('f001','SR','7214903421','Bengaluru','3','10.6');
insert into franchise values('f002','XYZ','8295603431','Mumbai','4','7.8');
insert into franchise values('f003','NS','7214904321','Hyderabad','2','3.4');
insert into franchise values('f004','AJ','7214987934','Chennai','5','5.6');

```

**Select \* from franchise;**

F_I D	F_NAM E	F_CONTACT	F_ADDRES S	EXPERIENC E	F_PURSE_VAL UE
f001	SR	7214903421	Bengaluru	3	10.6
f002	XYZ	8295603431	Mumbai	4	7.8
f003	NS	7214904321	Hyderabad	2	3.4
f004	AJ	7214987934	Chennai	5	5.6

```

insert into player values('p001','Hohni','07-July-1978','8','Ind','3231','130','t001','f004');
insert into player values('p003','Bravo','08-Aug-1983','5','WI','1002','78','t001','f004');
insert into player values('p004','Wastom','07-Dec-1982','6','Aus','2872','95','t002','f001');
insert into player values('p007','Richard','21-April-1989','2','NWZ','68','25','t002','f001');
insert into player values('p0021','Trent','17-Jun-1988','3','SA','99','39','t003','f002');
insert into player values('p0037','Root','08-July-1987','1','Eng','472','12','t002','f001');*/
insert into player values('p005','Deliiers','07-July-1980','7','SA','3052','117','t002','f001');
insert into player values('p0029','KP','27-Nov-1984','4','Eng','2045','58','t004','f003');
insert into player values('p0031','Alma','07-July-1978','8','SA','3011','130','t003','f002');
insert into player values('p008','VK','08-July-1981','6','Ind','3274','96','t002','f004');
insert into player values('p0013','Bhuvi','07-Oct-1986','4','Ind','185','56','t004','f003');
insert into player values('p0017','Pant','07-July-1978','2','Ind','1135','27','t004','f003');
insert into player values('p0019','Rahul','07-July-1978','3','Ind','1370','43','t001','f004');
insert into player values('p0025','Gil','08-July-1989','1','Ind','323','16','t002','f004');

```

**Select \* from player;**

P_ID	P_NAME	P_DOB	P_EXPERIENCE	P_COUNTRY	P_TOTALRUNS	MATCHES_PLAYED	T_ID	F_ID
p001	Hohni	07-JUL-78	8I	nd	3231	130	t001	f004
p003	Bravo	08-AUG-83	5	WI	1002	78	t001	f004
p004	Wastom	07-DEC-82	6	Aus	2872	95	t002	f001
p007	Richard	21-APR-89	2	NWZ	68	25	t002	f001
p0021	Trent	17-JUN-88	3	SA	99	39	t003	f002
p0037	Root	08-JUL-87	1	Eng	472	12	t002	f001
p005	Delieris	07-JUL-80	7	SA	3052	117	t002	f001
p0031	Alma	07-JUL-78	8	SA	3011	130	t003	f002
p008	VK	08-JUL-81	6	Ind	3274	96	t002	f004
p0013	Bhuvi	07-OCT-86	4	Ind	185	56	t004	f003
p0017	Pant	07-JUL-78	2	Ind	1135	27	t004	f003
p0019	Rahul	07-JUL-78	3	Ind	1370	43	t001	f004
p0025	Gil	08-JUL-89	1	Ind	323	16	t002	f004
p0029	KP	27-NOV-84	4	Eng	2045	58	t004	f003

```

insert into allrounder values('p0029','83','139.23','4','8.23');
insert into allrounder values('p0031','76','133.33','3','7.99');
insert into allrounder values('p004','119','153.45','4','8.07');
insert into allrounder values('p003','57','129.78','4','7.65');

```

**Select \* from allrounder;**

P_ID	TOPSCOR E	STRIKE_RAT E	MOST_WICKE TS	ECONOM Y
p0029	83	139.23	4	8.23
p0031	76	133.33	3	7.99
p004	119	153.45	4	8.07
p003	57	129.78	4	7.65

```

insert into batsman values('p001','78','134.72');
insert into batsman values('p005','105','155.46');
insert into batsman values('p008','116','141.72');
insert into batsman values('p0017','82','135.65');
insert into batsman values('p0019','69','133.72');
insert into batsman values('p0025','91','132.72');
insert into batsman values('p0037','82','129.64');

```

**Select \* from batsman;**

P_ID	TOPSCOR E	STRIKE_RAT E
p001	78	134.72
p005	105	155.46
p008	116	141.72
p0017	82	135.65
p0019	69	133.72
p0025	91	132.72
p0037	82	129.64



```

insert into bowler values('p007','4','7.23');
insert into bowler values('p0021','4','7.04');
insert into bowler values('p0013','5','7.15');

```

**Select \* from bowler;**

P_ID	MOST_WICKETS	ECONOMY
p007	4	7.23
p0021	4	7.04
p0013	5	7.15

```

insert into participating values('m001','p001');
insert into participating values('m001','p005');
insert into participating values('m001','p008');
insert into participating values('m002','p001');
insert into participating values('m002','p005');
insert into participating values('m002','p008');
insert into participating values('m007','p0013');
insert into participating values('m007','p0017');
insert into participating values('m007','p004');
insert into participating values('m007','p007');
insert into participating values('m005','p0031');
insert into participating values('m005','p0021');
insert into participating values('m008','p0029');
insert into participating values('m009','p0019');
insert into participating values('m009','p0025');
insert into participating values('m0011','p003');
insert into participating values('m0015','p0025');
insert into participating values('m0017','p0017');
insert into participating values('m0021','p004');
insert into participating values('m0025','p001');
insert into participating values('m0025','p005');
insert into participating values('m0025','p008');
insert into participating values('m0025','p0037');

```

Select \* from participating;

M_NO	P_ID
m001	p001
m001	p005
m001	p008
m002	p001
m002	p005
m002	p008
m007	p001 3
m007	p001 7
m007	p004
m007	p007
m005	p003 1
m005	p002 1
m008	p002 9
m009	p001 9
m009	p002 5
m001 1	p003
m001 5	p002 5
m001 7	p001 7
m002 1	p004
m002 5	p001
m002 5	p005
m002 5	p008

m002	p003
5	7

### 5.3 QUERY EXECUTION

#### 1.Display the team name of the winner of final.

select t\_name from team,match where team.t\_id=match.m\_winner and m\_type='Final' and team.t\_id=m\_winner;

T_NAME
SBG

#### 2.Display the number of teams participating in the league.

Select M\_Winner,count(M\_Winner) as c from Match group by M\_Winner having c>3;

COUNT(T_ID)
4

#### 3.Display the match\_no of matches played in Bengaluru.

Select m\_no from match where m\_location='Bengaluru';

M_NO
m002
m009
m002
1

**4.Find the names and team for which they play for all foreign players.**

Select P\_Name,T\_ID from Player where P\_country not like 'Ind%';

P _ N A M E	T_ID
Bravo	t001
Wastom	t002
Richard	t002
Trent	t003
Root	t002
Delier s	t002
KP	t004
Alma	t003

**5.Find the name of players beginning with H**

Select p\_Name from Player where p\_Name like 'H%';

P_NAM E
Hohni

**6.Update the economy of Bravo to 8.89**

Update allrounder set Economy =8.89 where P\_ID = (Select P\_ID from Player where P\_Name='Bravo');

select \* from allrounder where p\_name='Bravo';

P_ID	TOPSCORER	STRIKE_RATE	MOST_WICKETS	ECONOMY
p003	57	129.78	4	8.89

**7.Display the name of umpires in alphabetical descending order.**

select u\_name from umpire order by u\_name desc;

U_NAME
TIM
SALEVA
RAVI
MORKE
L
JOS
COTLER
COOK
ALIM

**8.Find the batsman with strike rate greater than average strike rate.**

Select P\_ID from Batsman where strike\_rate>(Select avg(Strike\_rate) from Batsman);

P_ID
p005
p008

### 9. Update the top score of Hohni to 183.

Update Batsman set TopScore = 183 where P\_ID=(Select P\_ID from Player where P\_Name='HONI');

P	TOPSCORE	STRIKE_RATE
p	183	134.72

### 10. Update the top score of Wastom to 54.

Update allrounder set topScore = 54 where P\_ID=(Select P\_ID from Player where P\_Name='Wastom');

P	TOPSCORE	STRIKE_RATE	MOST_WICKETS	ECONOMY
p	54	153.45	4	8.07

### 11. Modify the strike rate schema from Number(10,2) to Number(10,3).

Alter table Batsman modify (Strike rate Number (10,3));

Table altered.

### 12. Create a view Player\_Details from Player table which will have Player ID, Name, Total Runs and Matches Played having Total runs more than 500.

Create view Player\_Details as Select P\_ID,P\_Name,P\_TotalRuns,Matches\_Played from Player where P\_TotalRuns>500;

Select \* from Player\_Details;

P_ID	P_NAME	P_TOTALRUNS	MATCHES_PLAYED
p001	Hohni	3231	130
p003	Bravo	1002	78
p004	Wastom	2872	95
p005	Deviier s	3052	117
p002 9	KP	2045	58
p003 1	Alma	3011	130
p008	VK	3274	96
p001 7	Pant	1135	27
p001 9	Rahul	1370	43

## **CONCLUSION**

In this project, we have designed a database for a FRANCHISE CRICKET LEAGUE. We have modeled the database into ER Model as well as Relational Model before implementing it through the database management system ORACLE. During the process, we came across different requirements and analysed those to get the proper structure of the design. The design was intended to be less complicated and adaptable to different sports. We focussed mainly on Cricket with some of the assumptions mentioned. We filled the data in the table to generate queries of all extent. Our motive was to give the model a realistic approach. We generated and executed all kinds of queries, tried to touch all types. We have found that, it will be very helpful to store and access data in a least complicated approach with all the relationships maintained. Even, we found that our design can work for any such sports league database with slight modifications and changes in our assumptions and very few entity change. We feel that with the increasing popularity of sports, the data will grow from day to day. So, the need of effective storage of data arises with efficient modelling of storage and access. We feel that we have filled that void of need by our design, which is easy to use and less complicated. This gives us a hope of great scope for our project in the future.



## REFERENCES

- Beginning Database Design By Gavin Powell
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