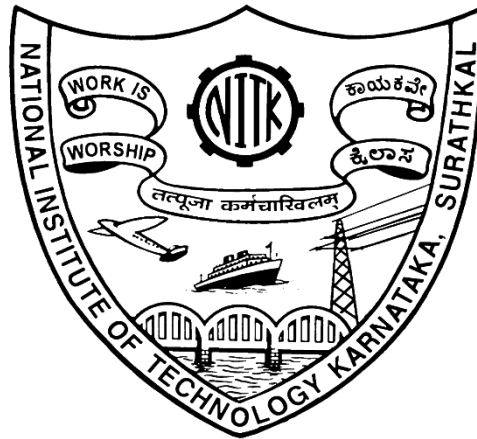*A Course Project Report on*
Cricket Tournament Application

Undergone at
National Institute of Technology Karnataka

Under the guidance of
M. Venkatesan

Submitted By
Chakradhar Malagundla, Kunal. M
(16CO226), (16CO227)

in partial fulfilment of the requirements for the award of the degree of
Bachelor of Technology
In
Computer Science & Engineering

Department of Computer Science and Engineering
National Institute of Technology Karnataka
July-Dec 2018

DECLARATION

We certify that the report on 'Cricket tournament application' which is being submitted as record of my course project is a bonafide report of the work carried out by our team. The material contained in this report has not been submitted to any university or Institution for the award of any degree.

Abstract

Our application maintains all the data regarding a cricket tournament. It includes matches schedule, team data, player data, runs scored in the tournament, wickets taken and other relevant information.

Admin of the application will have the access to add/remove any player, update player data or team data and update match results and schedule.

Other users can view data required by them such as player profile, team profile, match schedule, match results etc. All the tournament stats can be explicitly viewed by anyone without having to login to the application.

This application can be very useful for maintaining huge amount of data generated in a tournament and store it in table so that any user can view match results or tournament stats. The data stored this application can be further used to analyze players performance and this can help teams and players to analyze their performance. In our project, we have taken IPL-2008 data and have done the application for the IPL season 2008.

CONTENTS

LIST OF TABLES AND FIGURES

Introduction

1.1 Purpose

This application is developed for cricket lovers who wish to track the live updates of the match score and the stats of the tournament and view the player information. The application provides the complete list of all the matches in the tournament and the summary card of all the matches along with the stats.

1.2 Objective

The main objective of the application is to maintain a tournament data properly and keep track of all the match data and stats of each player and team through out the tournament so that it can be viewed any time and by any one.

Requirement Analysis and specifications

The aim of the application is to create and run a cricket tournament smoothly handling all the data generated in the tournament.

2.1 Software Requirements

- **Web server:**

We have used apache web server for deploying our website. Apache supports a variety of features, many implemented as compiled modules which extend the core functionality. These can range from authentication schemes to supporting server-side programming languages such as Perl PHP.

- **DBMS:**

We use MySQL as the development platform for database. The use of MySQL along with php language has been used for connecting web pages with our database. Apache is providing with phpMyAdmin which helps in database operations.

- **Other Development Software:**

Windows 7 or higher version of windows operating system / Unix Operating systems.

Ms office for preparing reports.

Text Editor – notepad++

Online tools-ERD plus for ER diagram and relational schema

2.2 Hardware Requirements:

Since we are not deploying our system for real as it is project we need not require any hardware requirements for as of now. But if at all it is deployed then need to have reliable web server which is fast in all situation. We might also need a separate machine serving as a server to handle large number of transactions and data.

Database Design

3.1 ER diagram:

This ER Diagram represents the model of our application entities. This entity relationship diagram shows the relation between entities like player, team, matches.

PLAYER Entity

Attribute Name	Meaning	Value
Player_id	This represents the id of player	int(11)
player name	Name of the player	varchar (20)
DOB	Date of Birth of the player	Date
Country	Represents the Country of the player	varchar (20)
Runs	Represents the Runs of the player	int(11)
Average	Represents the Average of the player	int(11)
Strike rate	Represents the Strike Rate of the player	int(11)
Fours	Represents the Fours of the player	int(11)
Wickets	Represents the Wickets of the player	int(11)
Sixes	Represents the Sixes of the player	Int(11)
economy	Represents the economy of the player	Int(11)
Mom awards	No. of MoM awards won by the player	int (11)

Highest score	Highest score of the player	int(11)
Batting style	Represents the batting style of the player	varchar(20)
Bowling style	Represents the bowling style of the player	Varchar(20)

TEAM Entity

Attribute	Meaning	Value
Team id	Represents the id of the team	int(11)
Team name	Name of the team	varchar(20)
Matches_won	No. of matches won by the team till date	int(11)
Matches_lost	No. of matches lost by the team till date	int(11)
Runs	Total runs scored by the team till date	int(11)
Wickets	Total wickets taken by the team till date	int(11)
No_of_trophies	No. of trophies previously won till the current season	Int(2)
Fours	Represents the Fours of the Team	Int(11)
Sixes	Represents the Sixes of the Team	Int(11)
Net_runrate	Represents the Net run rate of the Team	Int(11)

ADMIN Entity

Attribute	Meaning	Value
Admin_id	Admin id of the admin which he uses for logging into his portal	Int(10)
Password	Password which is used along with the Admin id for authentication	varchar(20)

MATCH Entity

| Attribute	Meaning	Value
Match_id	This represents the id of MATCH	Int(11)
Result	Represents the team id of the match winning team	Int(11)
Date	Represents the date on which the match is scheduled0	Date

MoM	Represents the player id of the man of the match	Int(11)
Toss	Represents the team id of the toss winning team	Int(11)
Toss_choice	Represents the toss decision taken	varchar(20)
Win _type	Represents the type of win in the match for the winning team	varchar(20)
Win margin	Represents the margin of victory for the winning team.	varchar(20)

VENUE Entity

Attribute	Meaning	Value
Venue_id	This represents the id of Venue	Int(11)
Capacity	Total capacity of venue	Int(11)
City	Represents the City in which the Venue is present	varchar(10)
Name	Name of the Venue	Varchar(10)

OWNER Entity

| Attribute	Meaning	Value
Owner_id	This represents the id of Owner	Int(11)
Owner_name	Name of the Owner	Varchar(10)
Phone no	Phone number of the owner	Int(10)
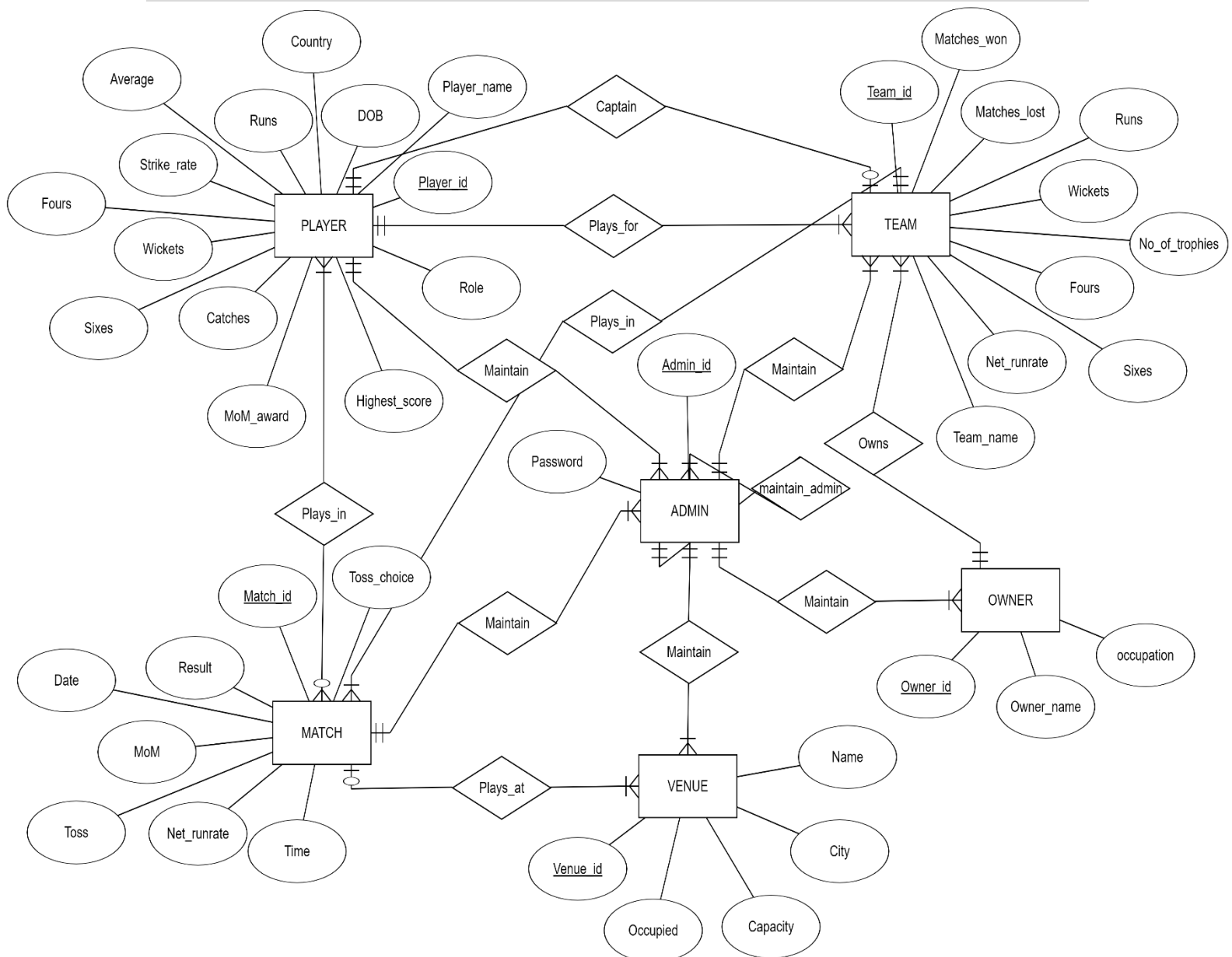
Description of ER diagram cricket tournament application:

Player, team, match, venue, owner, admin are the entities of our system. Their attributes are mentioned in the above tables. The type of relationship between player and team is n:1 because many players play for a team. The type of relationship between player and match is m: n that is a player can play more than one match and more than one player plays a match. The relationship between admin and player, admin and team, admin and match, admin and venue are 1: n. The relationship between team and match is 2: n. The primary keys of entities are player id, team id, match id, owner id, venue id, admin id.

3.2 Relational Database design

Our Relational Schema below is for the cricket tournament application.
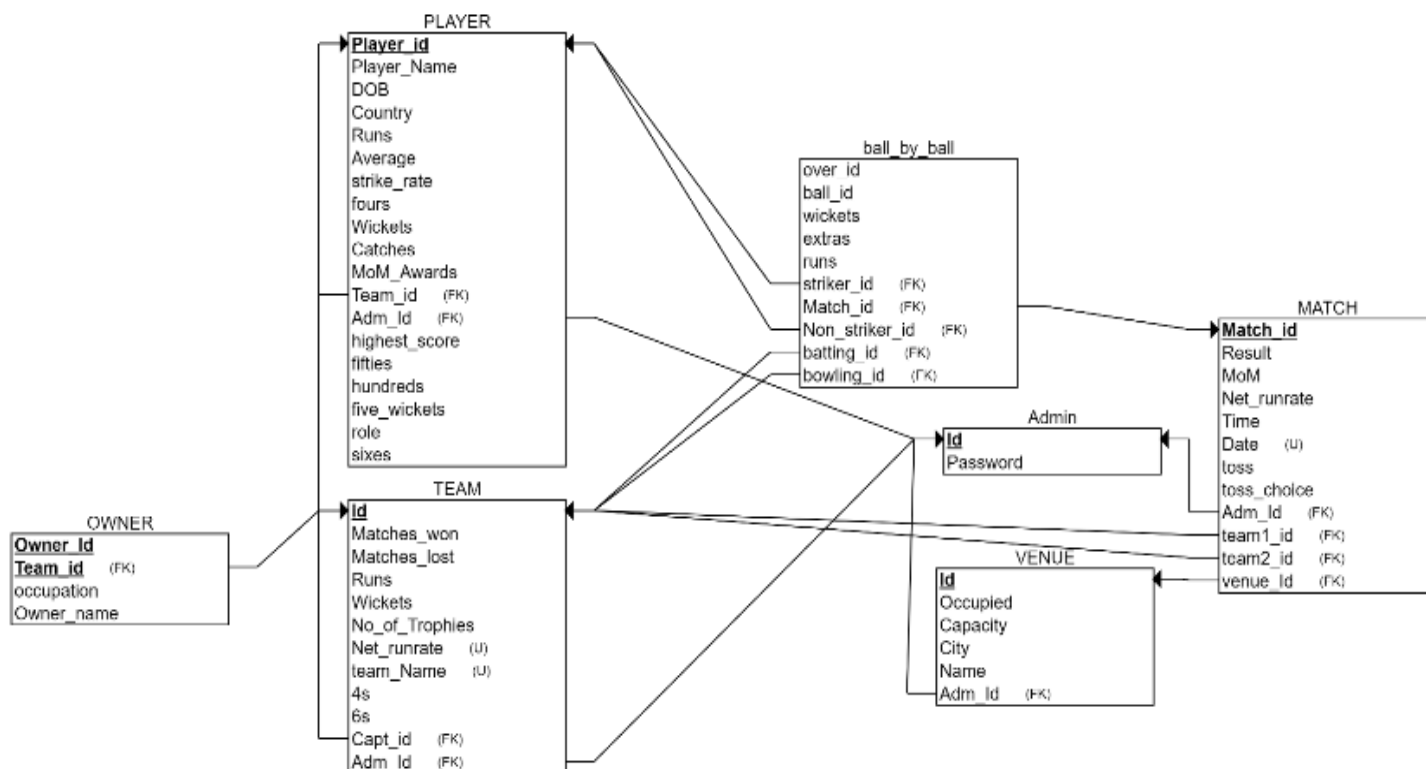
There are total seven relations in our relational schema of our application. They are player, team, match, venue, owner, ball to ball, admin. All the relations and their attributes are described below.

Player (id, name, country, DOB, batting style, bowling style, runs, sixes, fours, hundreds, fifties, wickets, economy, MoM awards, average, strike rate, team id, admin Id)

The team Id is the foreign key referencing team relation.

The admin Id is the foreign key referencing admin relation.

Team (team_id, matches_won, matches_lost, runs, wickets, no_of_trophies, net_runrate, team_name, fours, sixes, captain_id, admin_id)

Captain Id is the foreign key referencing player relation.

Admin Id is the foreign key referencing the admin relation.

Matches (Match_id, result, MoM, Net_runrate, time, date, toss, toss_choice, admin_id,

team1_id, team2_id, venue_id)

result, toss, team1, team2 are foreign keys referencing team relation.

Admin id is foreign key referencing admin relation.

Venue id is the foreign key referencing venue relation.

Venue (Venue_id, occupied, capacity, city, name, admin_id)

Admin id is the foreign key referencing admin relation.

Owner (Owner_id, occupation, owner_name, team_id, admin_id)

Team id is the foreign key referencing team relation.

Admin id is the foreign key referencing admin relation.

Admin (admin_id, password)

Ball to ball (Over_id, ball_id, wickets, extras, runs, striker_id, match_id, non_striker_id, batting_id, bowling_id)

Batting Id, Bowling Id are foreign keys referencing team relation.

Match Id is the foreign key referencing the match relation.

Striker, non-striker, bowler are foreign keys referencing player table.

There is an extra relation named ball to ball. This is generated because of the relation between player and match, match and team. It is m: n. So, we need to create a new relation, include primary keys of player, team, match as foreign keys in ball to ball and attributes of relation are also included as attributes in the relation. The primary keys of both the relation are pointed to the foreign keys. The attributes of the relationship that is over Id, ball Id are also mentioned in this relation.

3.3 Constraints in relation Schema

- ### Key constraints

Primary keys- player (player Id), team (team Id), owner (owner Id), venue (venue Id), match (match Id), admin (admin Id), ball to ball (batting Id, over Id, ball Id);

- ### Cardinality Ratio:

Cardinality ratio indicates the relationship type between entities

The relationship type between

1) Player and team = N: 1

This is due to that many players play for a single team.

2) Player and match= M: N

A player can play more than one match and a match has more than one player.

3) Team and Match=1: N

A team plays more than one match and a match has two teams.

4) Match and venue= N: 1

Each match is played at one venue and a venue can host more than one match.

5) Owner and Team= N: 1

An owner owns only one team and a team can have many owners.

6) admin and player=1: N

Admin can add more than one player.

7) admin and team=1: N

Admin can add more than one team.

8) admin and match=1: N

Admin can add more than one match.

9) admin and owner=1: N

Admin can add more than one owner.

10) admin and venue=1: N

Admin can add more than one venue.

11) admin and admin=1: N

One Admin can add more than one admins. This is a recursive relationship involving admin.

Participation constraints:

1) Player and Team=

   player- Complete participation

   Team- Complete participation

2) Team and Match=

   Team- complete participation

   Match- complete participation

3) Player and Match=

   Player- partial participation

   Match- complete participation

4) Match and venue=

   venue- partial participation

   Match- complete participation

5) Owner and Team=

   Owner-complete participation

   Team- complete participation

6) admin and player=

   Admin- partial participation

   Player- complete participation

7) admin and team=

   Admin- partial participation

   Team- complete participation

8) admin and match=

   Admin- partial participation

   Match- complete participation

9) admin and owner=

   Admin- partial participation

   Owner- complete participation

10) admin and venue=

   admin- partial participation

venue- complete participation

11) admin and admin=

Super Admin- complete participation

admin- complete participation

Project Components

4.1 Front end Design

We have used html, CSS and JavaScript, bootstrap for the front-end design

Pictorial view of flow of website
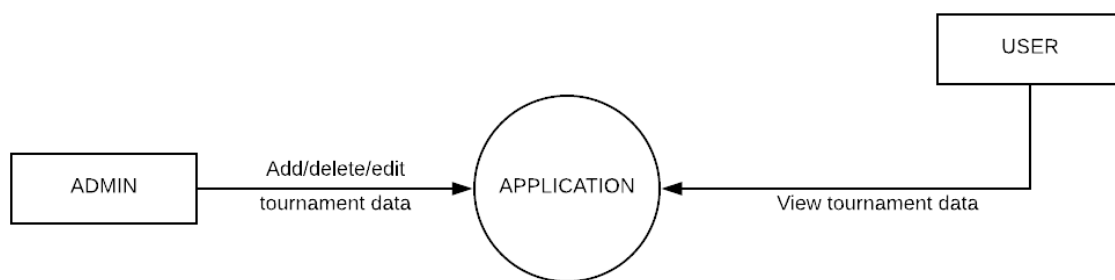
Pictorial notation of modules
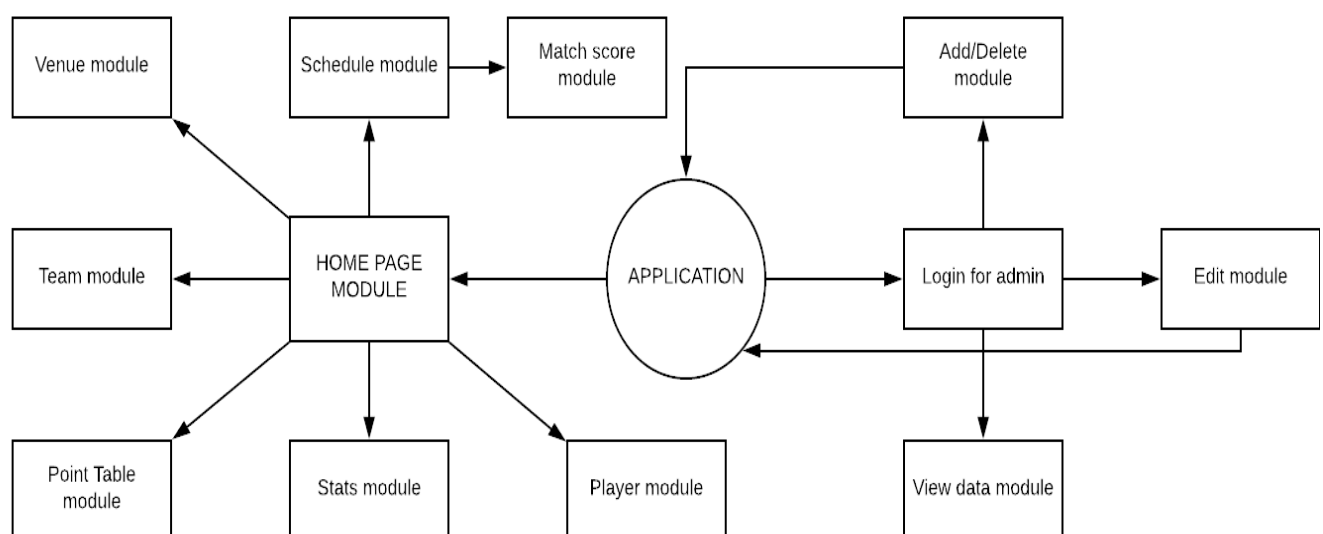
Login Module:

There are three users in our system. The normal users need not login and can directly use our application to view all the player data, tournament statistics and all the match scores and results. The admins have to login to the application to have access to edit or add or delete the player, team or any other tournament related data. The super admin can do all the activities that an admin can do along with the extra job of adding/deleting the admins.

Teams and venues module:

This module first shows the list of all the teams and venues in the tournament. When the user selects a particular team, a new webpage displaying the team information and the squad list of the team. The venue module contains the basic information about the venue.

Schedule and Points table module:

This module contains the schedule of all the matches in the tournament along with the points table of the tournament. The table will be updated after the result of each match is updated by the admin. The newly added matches will be added into the schedule as and when added by the admins.

Player Profile module:

This module contains the list of all the players playing in the tournament along with their basic personal data. Full data regarding a player can be viewed by clicking on the player's name which opens another webpage containing complete stats with respect to the selected player.

Match score module:

After clicking on a match, the application is redirected to this module. This module contains the match summary and the score card if the match is completed. If the match is live, then the score summary will be updated as and when updated by the admins. The pre-match data for the upcoming matches will be displayed if the match selected is not yet played.

Stats module:

This module contains the total statistics of the tournament. It also contains filters to filter the results by team, age group and nationality. We can also view the complete list for any specific stats by clicking on the box containing the required stat.

Edit module:

This module is only accessible by the admins and is used to alter or change the tournament data in the middle of the tournament like player's personal information, schedule, team information, add after match data etc. normal users cannot use the module as their access is restricted.

Addition module:

This module can be accessed only by the admins and is used to add player, team, owner, match, venue etc. The admin can add the details of the selected entity using the form to insert the data into the database.

Deletion module:

This module is also used by admin for deleting the tournament data like player, team, venue, match etc. The admin needs to enter respective id. After submitting it all the details of the selected item will be displayed in a read only mode to check. Delete button is provided at end to delete the entity.

View module:

This module is used by all the users. The admin can view the details of all players, teams, matches and stats of the tournament where as other users can view all the data specified through links in the user home module.

User Home module:

The home module consists of the links to current matches and to the most recent and upcoming matches. It can be accessed by all the users. It also contains the overall gist of the tournament and also links to other modules.

Admin Home module:

The home module consists of the links to view the tournament data and also add/ delete and edit the various modules in the tournament like player, team, venue, matches etc.
Admin has to login through the login page to open this module and this module is only accessible by the admins.

Logout module:

Logout is provided or admin and authoriser to come out of session.

4.2 Security Measures:

1.SQL INJECTIONS

SQL injection is the placement of malicious code in SQL statements, via web page input. Our application uses a PHP function mysqli_real_escape_string () which escapes some special characters in a string for use in SQL statement. This function is used to make data safe before sending a query to MySQL. Instead of using direct query statements we use prepare statements to execute the query where ever required i.e. if a query uses web page input. Prepared Statements use bound parameters and do not combine variables with SQL strings, making it impossible for an attacker to modify the SQL statement. Prepared Statements combine the variable with the compiled SQL statement, so that the SQL and the variables are sent separately.

2.INSECURE DIRECT OBJECT REFERENCES

In our application, pages which can change the tournament data are accessible only by the admin. We have blocked other invalid users from accessing these pages directly without logging in to protect the tournament data from malicious users. If a user tries to directly open such a page, he will be redirected to the admin login page where he will have to login to get the access to such pages.

3.BROKEN AUTHENTICATION AND SESSION MANAGEMENT

All login websites are managed using sessions. Our website creates a session when an admin is logged in using their unique user id. This prevents the data of one type of user to be accessed by other type users for example, admin and super admin. We used PHP sessions to create a session for super admin/admin. Also, if a logged in user tries to go back from the admin home page, he cannot go to the login page as it is a fatal error and similarly after logging out, he cannot go back to the admin accessible pages. If he tries to do so, he will be redirected to the login page.

4.CROSS-SITE REFERENCE FORGERY

We are using the csrf token function which generates a token for every request sent by the client thus authenticating the client at the server side. The token is generated at the client-side forms and server session and these both are checked for matching at the server side. Thus, any request from any malicious person is prevented.

Results and Discussions

USER:

User Home page:

The home page is displayed immediately after opening our application. It contains links to other modules like teams, matches, players, schedule and stats in the navigation bar. Immediately, the user can see the summary of three matches, previous match, current match and the upcoming match. It is followed by the overall stats of the tournament. The complete stats are present in the stats page of our application. The page also contains login link for admins to click on to go to the login page.

Chennai Super Kings 156 / 5   /   KOLKATA KNIGHT RIDERS VS ROYAL CHALLENGERS BANGALORE

Rajasthan Royals 160 / 7   /   2018-11-16   M Chinnaswamy Stadium

Rajasthan Royals won by 3 wickets

TOTAL RUNS	MOST RUNS		MOST WICKETS	
16814	**SE MARSH**		**SOHAIL TANVIR**	
	616		24	
	59x4 26x6			
TOTAL WICKETS	G Gambhir	68x4, 8x6 534	IK Pathan	20
688	ST Jayasuriya	57x4, 31x6 514	SR Watson	20
	SR Watson	46x4, 19x6 468	SK Warne	20
	GC Smith	54x4, 8x6 441	JA Morkel	20

Points table:

This page contains a table showing the points of each team till date in the tournament. The table contains team name, matches won, lost, net run rate and total points obtained by each team in the tournament. On clicking on the team name, the website is redirected to team page containing the team data.

IPL-Indian Premier League

HOME   TEAMS   SCHEDULE   POINTS TABLE   STATS   VENUES   LOGIN

POINTS TABLE

Teams	Match	won	Loss	N/R	Points
Kolkata knight riders	11	5	6	1.1543	10
Royal Challengers Bangalore	14	4	10	-1.1242	8
Chennai Super Kings	16	9	7	1.2620	18
Kings XI Punjab	15	10	5	1.3456	20
Rajasthan Royals	16	13	3	-1.3011	26
Delhi Daredevils	14	7	7	-1.2680	14
Mumbai Indians	14	7	7	1.1977	14
sun risers hyderabad	14	2	12	-2.7680	4

localhost/submission/schedule.php

schedule:

This page contains a table showing the schedule of all the matches in the tournament. The table contains match id, team names, match date and venue name for each match. On clicking on the match id, the website is redirected to match score page containing the complete match data.

Match Id	Teams		Date	Venue
335987	Royal Challengers Bangalore	Kolkata knight riders	2008-04-18	M Chinnaswamy Stadium
335988	Kings XI Punjab	Chennai Super Kings	2008-04-19	Punjab Cricket Association Stadium, Mohali
335989	Delhi Daredevils	Rajasthan Royals	2008-04-19	Feroz Shah Kotla
335990	Mumbai Indians	Royal Challengers Bangalore	2008-04-20	Wankhede Stadium
335991	Kolkata knight riders	sun risers hyderabad	2008-04-20	Eden Gardens
335992	Rajasthan Royals	Kings XI Punjab	2008-04-21	Sawai Mansingh Stadium
335993	sun risers hyderabad	Delhi Daredevils	2008-04-22	Rajiv Gandhi International Stadium, Uppal
335994	Chennai Super Kings	Mumbai Indians	2008-04-23	MA Chidambaram Stadium, Chepauk
335995	sun risers hyderabad	Rajasthan Royals	2008-04-24	Rajiv Gandhi International Stadium, Uppal
335996	Kings XI Punjab	Mumbai Indians	2008-04-25	Punjab Cricket Association Stadium, Mohali
335997	Royal Challengers Bangalore	Rajasthan Royals	2008-04-26	M Chinnaswamy Stadium
335998	Chennai Super Kings	Kolkata knight riders	2008-04-26	MA Chidambaram Stadium, Chepauk
335999	Mumbai Indians	sun risers hyderabad	2008-04-27	Dr DY Patil Sports Academy
336000	Kings XI Punjab	Delhi Daredevils	2008-04-27	Punjab Cricket Association Stadium, Mohali

localhost/submission/pointstable.php

Stats:

This page contains the various statistics of the tournament. The header contains two sections batting and bowling and the user needs to select which stats he wants to see. The user can also filter each stats by selecting his teams, age group and country by setting the filters present on the left side of the page. The stats get changed dynamically as per the selection of the user. The user needs to select at least one team to show the results without any error. If the user clicks on any stat, the website is directed to another page containing complete list of the particular stat which also can be filtered as per the wish of the users.
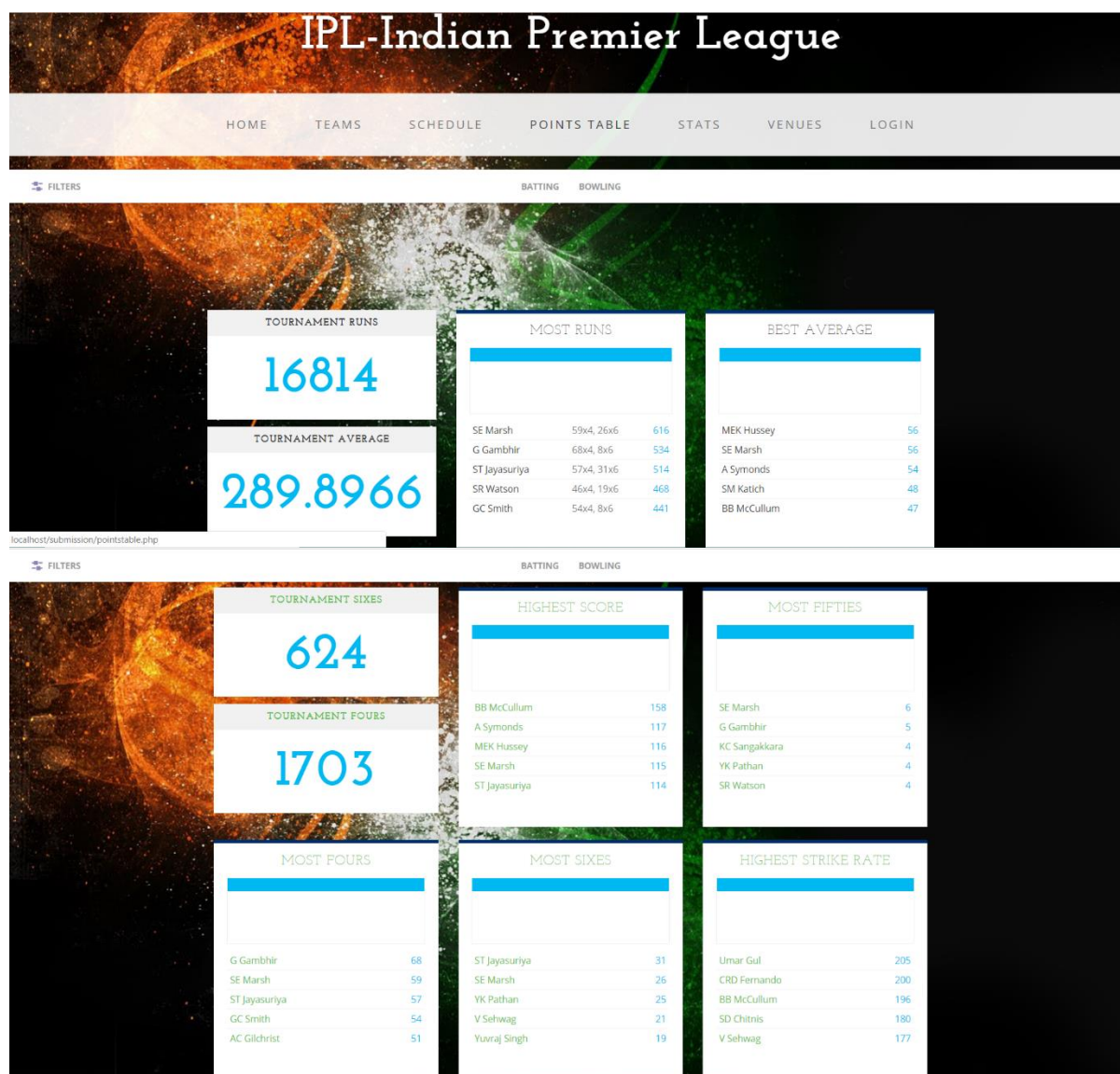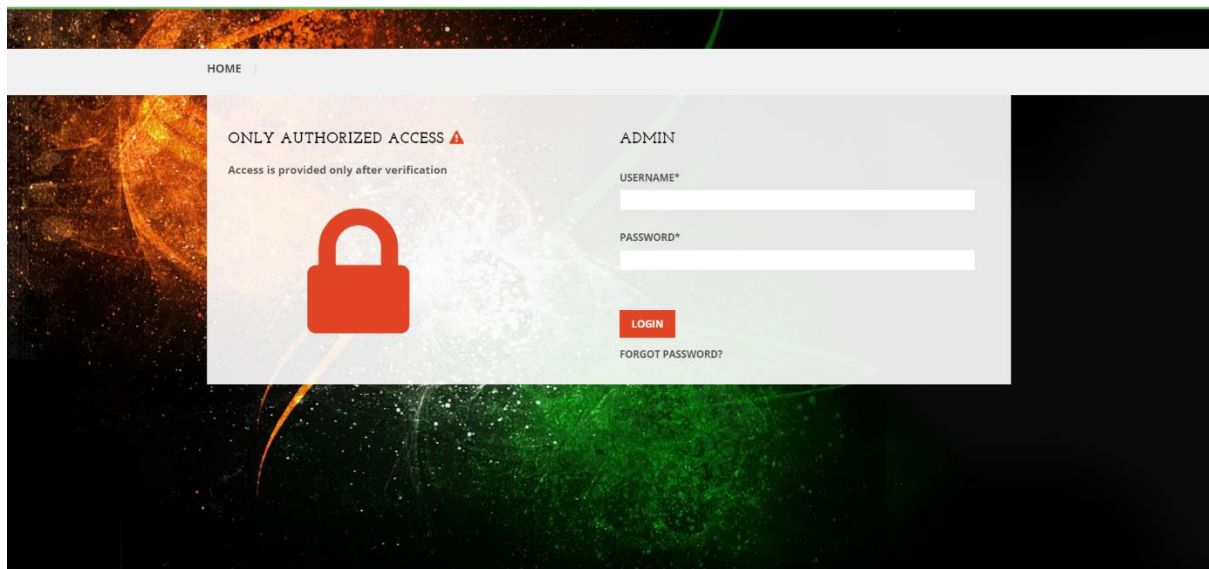
Teams:

This page contains a list of all the teams playing in the tournament. The user on clicking on each team will be directed to the team page containing the data like team name, home ground, owner name, captain name etc. The page also contains the complete squad list of the team. On clicking on a player's name, the player's page will be opened.
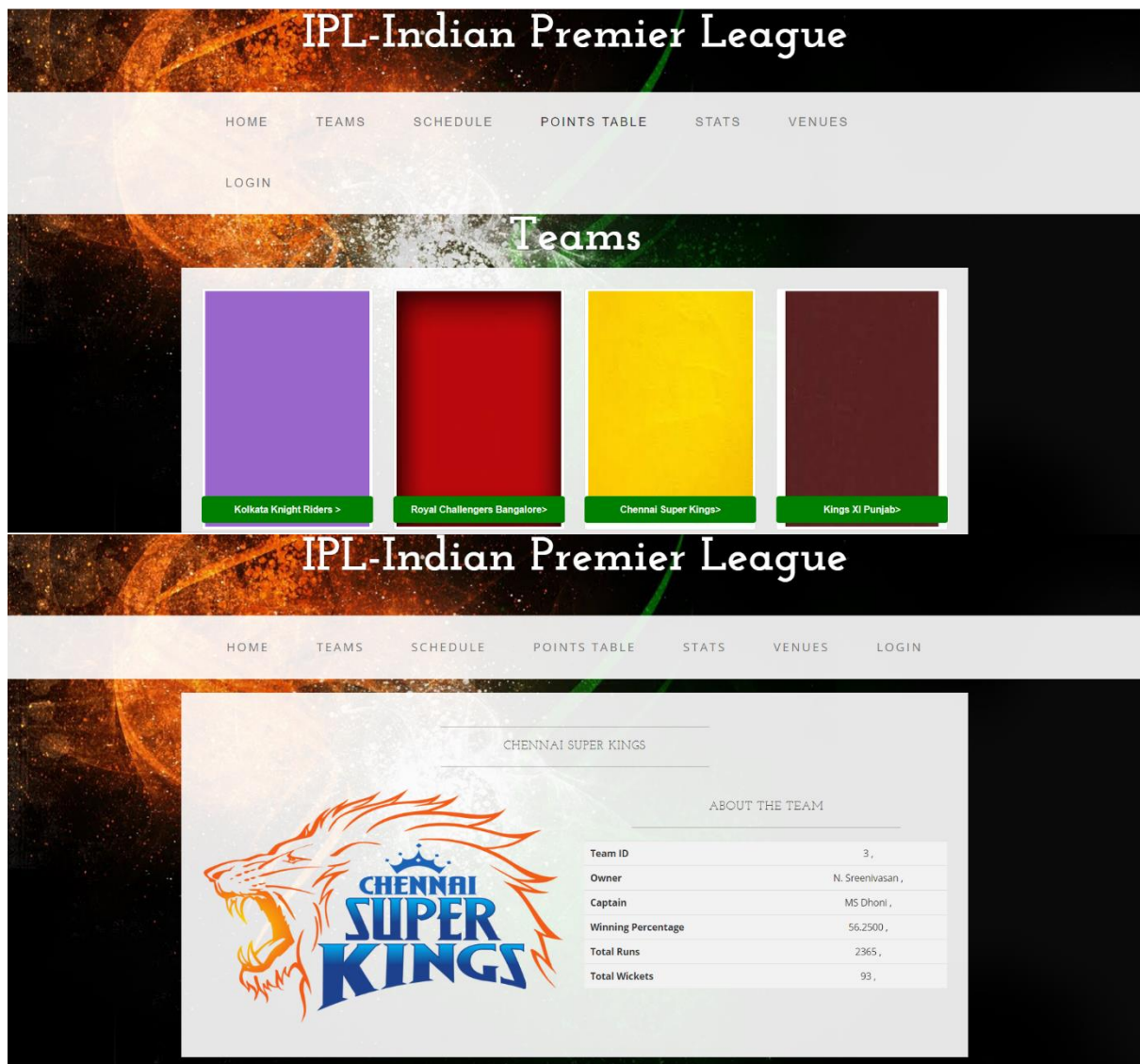
Venues:

This page contains a list of all the venues in the tournament. The user on clicking on each venue will be directed to the venue page containing the data like venue name, city, capacity, home team etc.
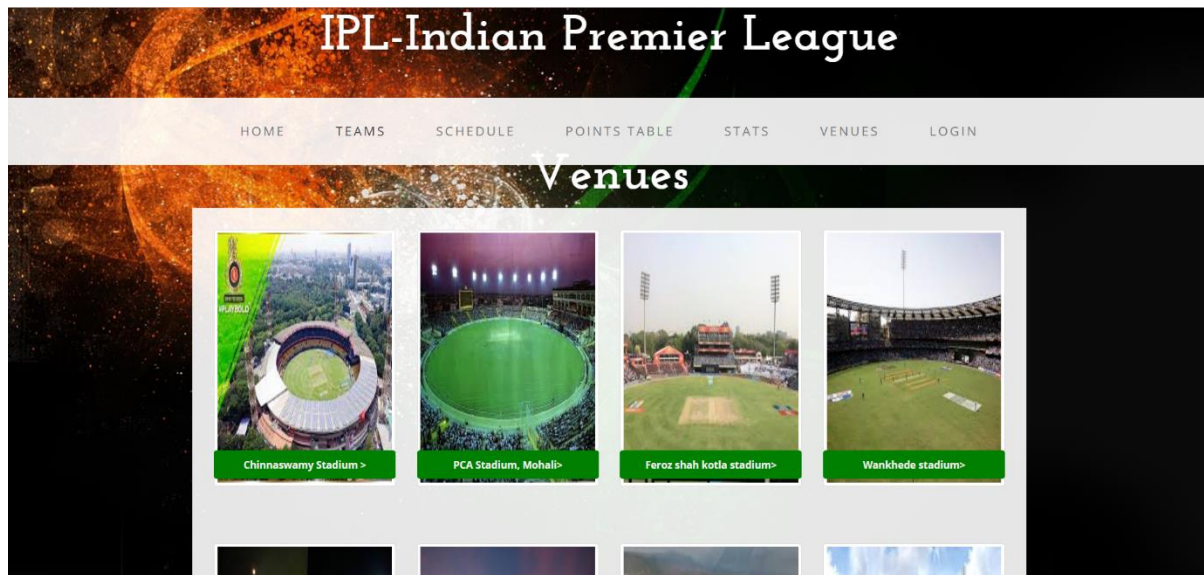
Match Score:

This page contains all the data related to a match. The first section shows the pre-match data like teams playing, venue, match date etc. The second section shows us the summary score and the match winner details and margin of victory. The third section shows the data related to man of the match. On clicking the name of the man of the match, his profile will be opened. His personal score in the match will be displayed. The next section contains the score card of each team individually.

ROYAL CHALLENGERS BANGALORE SCORE CARD

Player Name	Runs	Wicket-Taker
R Dravid	2	I Sharma
W Jaffer	6	AB Dinda
V Kohli	1	AB Dinda
JH Kallis	8	AB Agarkar
CL White	6	AB Agarkar
MV Boucher	7	S Ganguly
B Akhil	0	AB Agarkar
AA Noffke	9	S Ganguly
P Kumar	18	
Z Khan	3	S Ganguly
SB Joshi	3	LR Shukla

KOLKATA KNIGHT RIDERS SCORE CARD

Player Name	Runs	Wicket-Taker
S Ganguly	10	Z Khan
BB McCullum	158	
RT Ponting	20	JH Kallis
DJ Hussey	12	AA Noffke

Players:

This page contains a list of all the players in the tournament. The user on clicking on each player will be directed to the player page containing his personal data as well as tournament stats of the player till date.

PLAYER PROFILE

Name	MS Dhoni
Country	India
Age	37
Batting Style	Right_Hand
Bowling Style	Right-arm medium
Team Name	Chennai Super Kings
MoM awards	2
Runs	414
Average	30
strike Rate	130
Highest score	65
Fours	38
sixes	15
Hundreds	
fifties	2
wickets	
5 wickets	

Admin:

Admin Login Page:

The authorizer login form consists of two text boxes. On entering the credentials and submitting he will be logged into his portal. This page also contains a link to go back to the main home page of our application in case some users accidentally enter this page.

Admin Home page:

After logging in from the home page, admins are re-directed to this page. This page contains links to add/delete/edit players, teams, matches, schedule, venues etc.

It also contains links to see points table, stats, schedule, stats, player profiles etc.
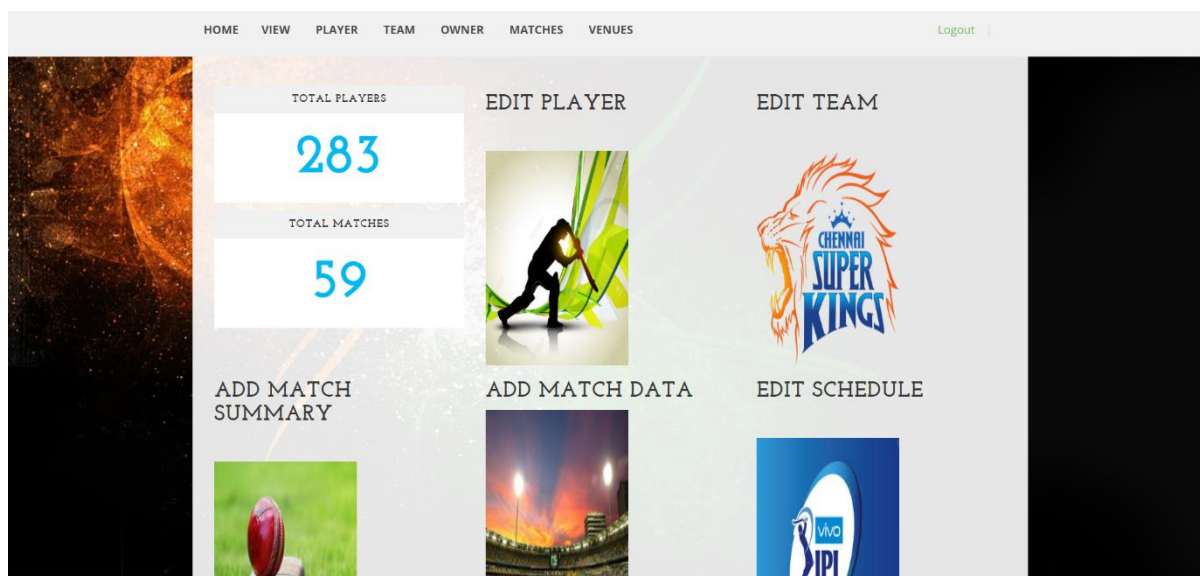
Add Player:

This is one of the most important tasks. The admin adds player by entering his details in the text boxes shown. The player id is auto-incremented in the database. There is a submit button below. After submitting the values database will be changed.
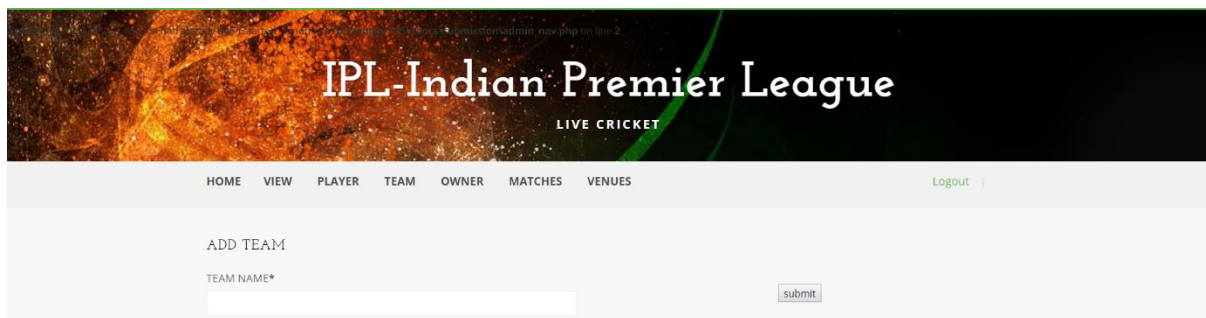
Player in the menu bar is drop down list consisting of add player and delete player. Duplicate values are not allowed in the database and any player with same data in all the fields will not be added. On success, the admin will be redirected to home page and if it is a failure, the add player page will be refreshed.

Add team:

This is one of the most important tasks. The admin adds team by entering the details in the text boxes shown. The team id is auto-incremented in the database. There is a submit button below. After submitting the values database will be changed.

Team in the menu bar is drop down list consisting of add team and delete team. Duplicate values are not allowed in the database and any team with same data in all the fields will not be added. On success, the admin will be redirected to home page and if it is a failure, the add team page will be refreshed.
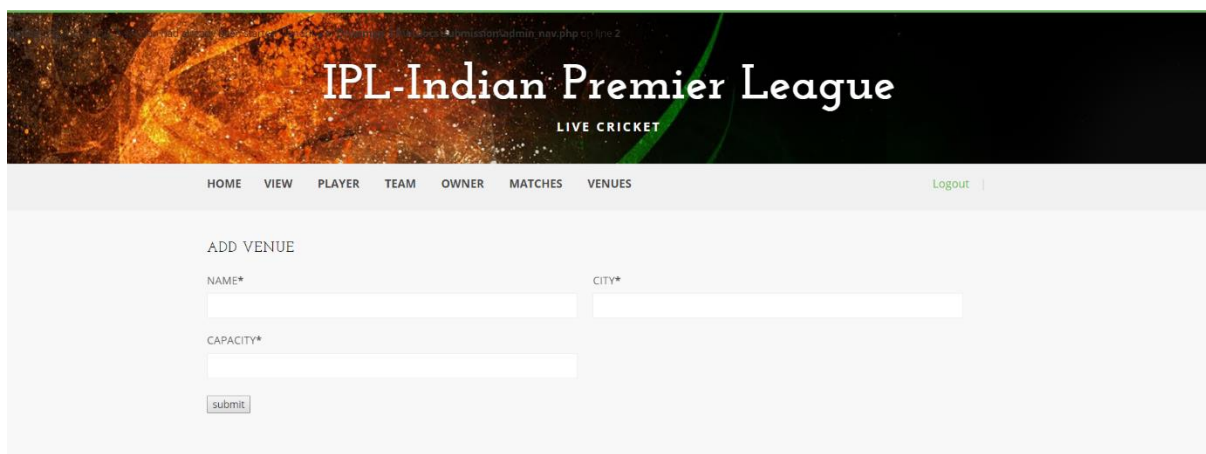
Add venue:

This is one of the most important tasks. The admin adds venue by entering the details in the text boxes shown. The venue id is auto-incremented in the database. There is a submit button below. After submitting the values database will be changed.

Venue in the menu bar is drop down list consisting of add venue and delete venue. Duplicate values are not allowed in the database and any venue with same data in all the fields will not be added. On success, the admin will be redirected to home page and if it is a failure, the add venue page will be refreshed.
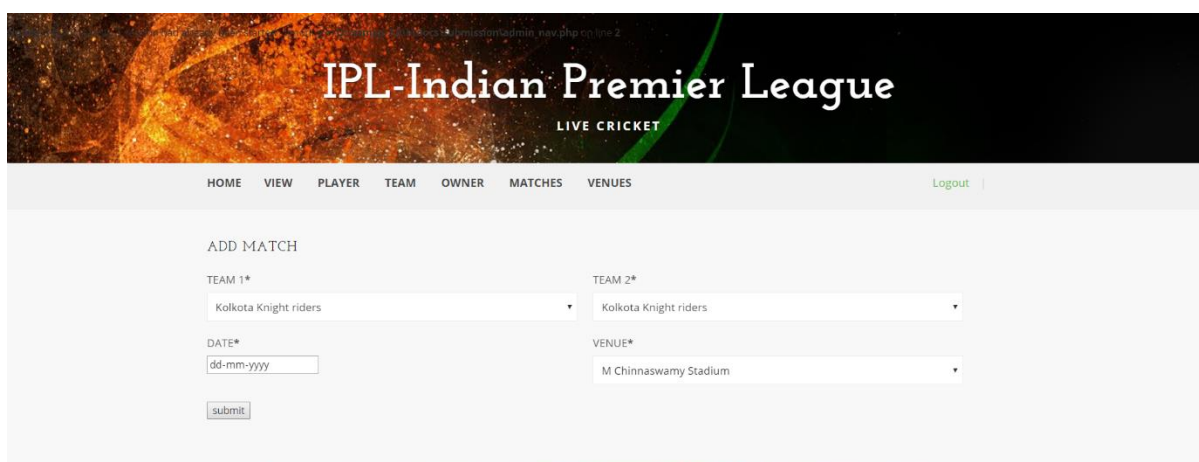
Add match:

This is one of the most important tasks. The admin adds match by entering the details in the text boxes shown. The match id is auto-incremented in the database. There is a submit button below. After submitting the values database will be changed.

Match in the menu bar is drop down list consisting of add match and delete match. Duplicate values are not allowed in the database and any match with same data in all the fields will not be added. On success, the admin will be redirected to home page and if it is a failure, the add match page will be refreshed. The admin is not allowed to enter the same team as team A and team B as it restricted in the database and if it occurs the page will be refreshed.

Add match data:

This module is used to enter match data ball by ball. The admin has to enter ball data in the fields provided. If the data is successfully inserted into the table, the home page will be opened else the same page will be refreshed.
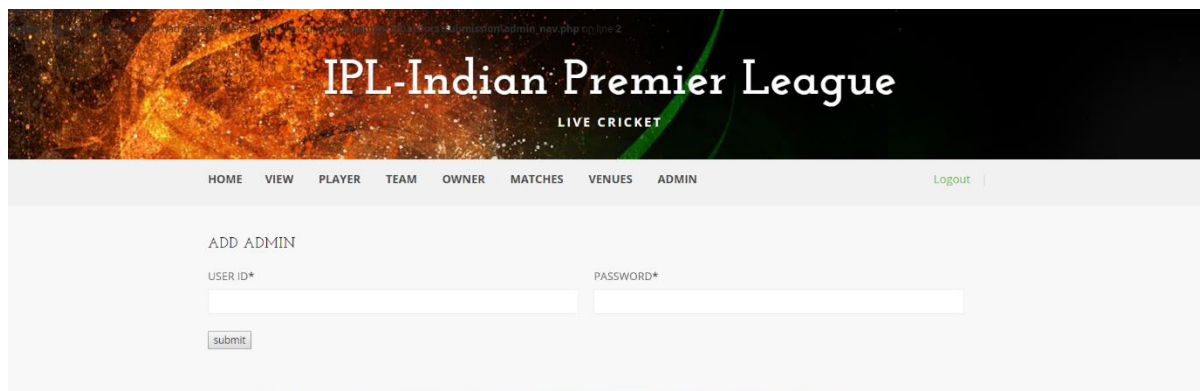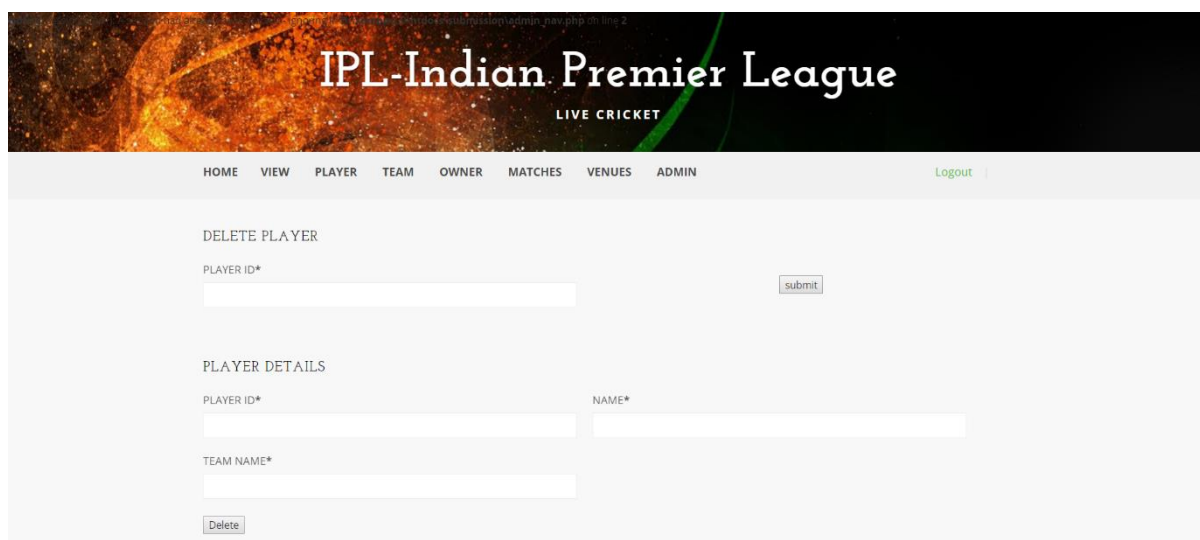
Add after match data:

This module is used to enter the after-match data. The admin has to enter the toss result, toss decision and match result and mom details of the match.

Add admin:

This is one of the most important tasks. The admin adds admin by entering the details in the text boxes shown. The admin id is auto-incremented in the database. There is a submit button below. After submitting the values database will be changed.

Admin in the menu bar is drop down list consisting of add admin and delete admin. Duplicate values are not allowed in the database and any admin with same data in all the fields will not be added. On success, the admin will be redirected to home page and if it is a failure, the add admin page will be refreshed. Only the super admin is allowed to access this page.

Delete player:

For deleting player, the admin needs to use the player id which he can view in the view players table. After entering the player id and submitting it all the details of the worker will appear in the below form where the admin can cross check the values. After clicking the delete button the record will be deleted from the database.
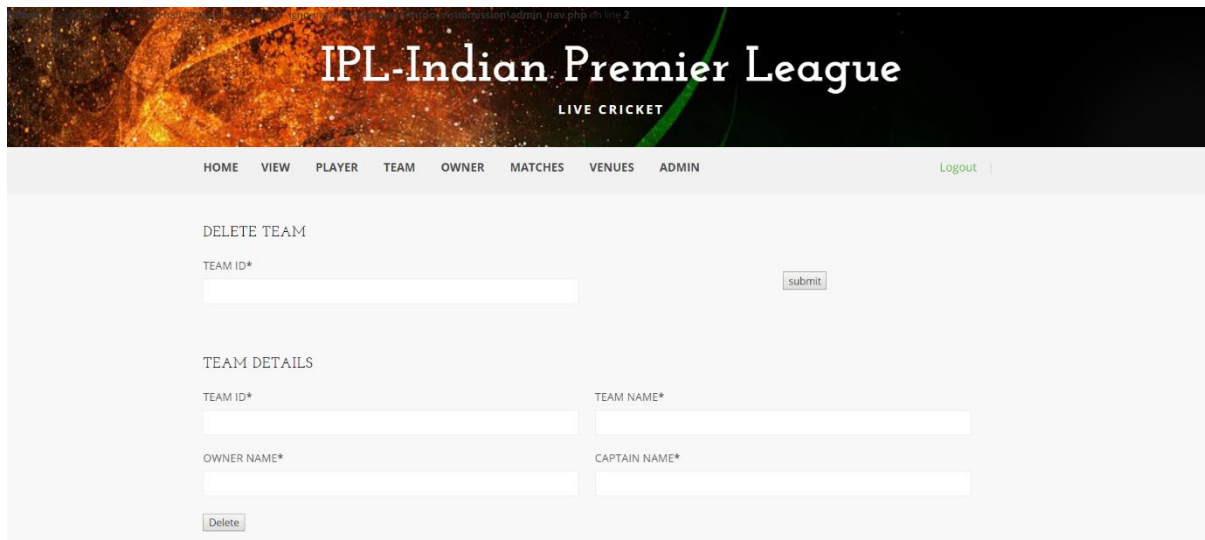

Delete team:

For deleting team, the admin needs to use the team id which he can view in the view teams table. After entering the team id and submitting it all the details of the worker will appear in the below form where the admin can cross check the values. After clicking the delete button the record will be deleted from the database.

Delete venue:

For deleting venue, the admin needs to use the venue id which he can view in the view venues table. After entering the venue id and submitting it all the details of the worker will appear in the below form where the admin can cross check the values. After clicking the delete button the record will be deleted from the database.

Delete match:

For deleting match, the admin needs to use the match id which he can view in the view matches table. After entering the match id and submitting it all the details of the worker will appear in the below form where the admin can cross check the values. After clicking the delete button the record will be deleted from the database.

Edit player:

The admin can use this module to edit player's data. The admin has to enter the player id and click submit to get the current details. The admin can edit the data in the same box where the current data appears. After clicking the update button the record will be updated from the database.

Edit team:

The admin can use this module to edit team's data. The admin has to enter the team id and click submit to get the current details. The admin can edit the data in the same box where the current data appears. After clicking the update button, the record will be updated from the database.

Edit match:

The admin can use this module to edit match's data. The admin has to enter the match id and click submit to get the current details. The admin can edit the data in the same box where the current data appears. After clicking the update button, the record will be updated from the database.

Logout:

On clicking logout, the admin will be logged out of session. On logging out the admin will be redirected to user home page.

Conclusion

Our application is intended for the cricket lovers who wish to check the score updates on the go and view tournament stats. Since this project has been designed exclusively as a project, certain complexities that are faced in real life like displaying a live match score ball wise and correctness of data are not maintained. Some assumptions like only super admin can manage all the admin accounts, only super admin can change admin passwords etc. were made will making this project. These minor assumptions can also be modified. This enhancement of the project can be easily be made without changing the current design and programming structure. The naming of the html, CSS, js php pages are made accordingly in keeping in view about modularity. All these names can be easily understood by any user, developer and tester.