(SCORE HEROES- A FANTASY FOOTBALL LEAGUE WEBAPP)

Project report submitted in partial fulfillment of the requirement for the degree of
Bachelor of
Technology in

Computer Science and Engineering/Information Technology
by

Itish Dhiman(151428)
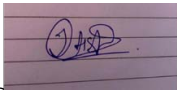
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Candidate's Declaration

I hereby declare that the work presented in this report entitled **" Score Heroes-A fantasy football league web app"** in partial fulfillment of the requirements for the award of the degree of **Bachelor of Technology** in **Computer Science and Engineering/Information Technology** submitted to the department of Computer Science Engineering and Information Technology**,** Jaypee University of Information Technology Waknaghat is an authentic record of my own work carried out over a period from January 2020 to May 2020 under the supervision of **Mr. Arvind Kumar** (Assistant Professor – CSE & IT).

The matter embodied in the report has not been submitted for the award of any other degree or diploma.

(Student Signature)
Itish Dhiman, 151428

This is to certify that the above statement made by the candidate is true to the best of my knowledge.

(Supervisor Signature)

Mr. Arvind Kumar

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Dated: 27-05-2020

ACKNOWLEDGEMENT

I take this opportunity to express my profound gratitude and deep regards towards my guide

Mr. Arvind Kumar (Assistant Professor , CSE & IT) for his exemplary guidance, monitoring and constant encouragement throughout the course of this project. The blessing, help and guidance given by him time to time shall carry me a long way in the journey of life on which I am are about to embark.

I am also obliged to staff members of JUIT College, for the valuable information provided by them in their respective fields. We are grateful for their cooperation during the period of our assignment.

Lastly, I thank the almighty, my parents and my classmates for their constant encouragement without which this
assignment would not have been possible.

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LIST OF ABBREVIATIONS

1 FPL : Fantasy Premier League

2 PHP : PreHypertext Processor

3 API : Application Program Interface

4 CGI : Common Gateway Interface

5 SQL : Structured Query Language

6 HTTP : HyperText Transfer Protocol

7 DOM : Document Object Model

8 PERL : Practical Extraction and Reporting Language

9 JSON : JavaScript Object Notation

ABSTRACT

This task took a gander at making an online framework to help in the choice of a Fantasy football group. Vital to this was the making of a framework which could adequately gather, rinse and utilize pertinent data put away on the Internet. It additionally included showing this data however the mechanism of a site. Positive client criticism was picked up amid assessment and the framework seemed to perform positively in the measure of focuses picked up, contrasted with customary strategies for choosing teams. The venture does caution that these tests are not totally thorough and proposes various ways the framework could be stretched out to additionally enhance its a capacity in assisting with the determination of a group.

Chapter-1 INTRODUCTION

1.1 Introduction :

Fantasy football is a platform in which the members fill in as the general chiefs of virtual expert football groups. The contenders pick their group lists by taking an interest in a draft in which all players of a genuine football association are accessible. Focuses depend on the real exhibitions of the players in true rivalry. The amusement ordinarily includes the players from the main 5 European Football alliances. The prominence of the amusement is expanding step by step and a large number of new clients have enrolled in a decade ago. Stages like dream football helps in advancing recreations and players and it had been discovered that new individuals have now begun to watch the game just to watch them gain focuses and cash for themselves. Most of the new clients are due to ease of availability of technology and evolution of these games with technologies. Now the increase in the number of clients is just due to more trending activities are related to these fantasy sports.

There are two kinds of imagination football associations. One that keep running for a season and other for one diversion week or match day. As indicated by a study, 41 million individuals play dream sports each year with normal age of 34 and the market is generally involved by adolescents. Most of the market involve those individuals who are looking to increase their interest in their sports and be much more involved in the competitions and tournaments. These fantasy leagues keep the fan base of sports attracted towards it in a much joyful and competitive way. Football dream idea initially ended up mainstream in daily papers where individuals chose their players and posted their players in the daily papers yet the issue was that they couldn't do the substitutions and the scoring wasn't quick. In some daily paper groups issue was that the point framework depended on their qualities and not their real exhibitions. This prompted a few people restricting the framework yet in mid 2000s online alliances came into picture and the current scoring techniques began to appear. Hurray first began the dream group

and it picked up a great deal of support and fame and enthusiasm from fans the world over. Seeing a huge number of individuals watching the games for dream associations official sites like dream chief alliance and la liga began their very own classes. Later in 2015 applications like dream11 and PL began to end up prevalent after finding the restrictions in the past ones.

The ascent of utilization of imagination groups have been in a colossal sum. This pattern isn't accomplishment for fans yet this additionally has given some of most pertinent data and measurements about players that have expanded their incentive in the market. This has driven a considerable lot of the exploring authorities to scout players in a very different and compelling way. For instance in the event that we find on account of football there are players with various sort of insights as:

\ • Tackles attempted

\ • Interceptions made

\ • Dribbles completed

\ • Passing accuracy

\ • Physicality

\ • Distance covered on the field

\ • Shots accuracy

A portion of these measurements were not accessible prior and players with these focuses were not sufficiently acknowledged as they are presently. So it is likewise deduced that fanstasy alliances are for the development of games fans as well as for the players to develop more and be significantly more important.

1.2 Problem Statement :

The idea for this venture began from the encounters of me and my companions. Being a piece of imagination sports for a long time we investigated a few imperfections in the more seasoned stages and groups that prompted us taking this task. Built up classes like FPL and dream11 didn't furnish us with the choice of playing the opposition among companions and there were a few limitations of player spending plan and number of players in each group which we have attempted to expel however much as could be expected. Another issue lies in the premade alliances, there is some opposition there however some of the time individuals don't care for contribution of cash in such classes and for that we have separate groups in our webapp. No complete sources were found to have fulfilled the above necessities and we felt that score saints could wipe out the majority of the previously mentioned issues.

The undertaking includes taking information from numerous sources and giving a premise to choice of players into the groups whether it be late shape or player esteem yet the most vital is getting data from various sources however the last dataset ought to be novel and enough for the amusement players to make their psyche.

The data is spread crosswise over various destinations, daily papers and there must be a solitary foundation to choose players. Nonetheless, issue of bounty could be an issue also in light of the fact that diverse sites utilize distinctive parameters to

1.3 Objectives :

The objectives of this project are as follows-

I. Gain a better knowledge of fantasy football and how it is different than betting systems and what kind of data is used for selecting a team. People sometimes get misled and rarely participate in such competitions because they are often told that fantasy games are another form of betting which is incorrect. It is totally different from that.

II. Making some changes in the existing platforms for a better user experience. As we have already explained some flaws in existing apps we would try to make this app better than the previous ones' number of players and information retrieval being the top priority

III. The designed system should be able to gather information from the trusted sources and provide user with a reliable criterion to select players into their teams.

IV. Provide a database that would store all the player information along with their recent form. Database would be updated daily so that the information and details are as latest as possible.

V. To store information of users in a secure way i.e. secure user signup and login. User information would be stored in such a way that even the creators won't be able to retrieve sensitive user information from the database

VI. Keep the waiting time to be as small as possible and update scores on daily basis which is a problem in fantasy leagues like FPL where all the information is updated once the game week is over.
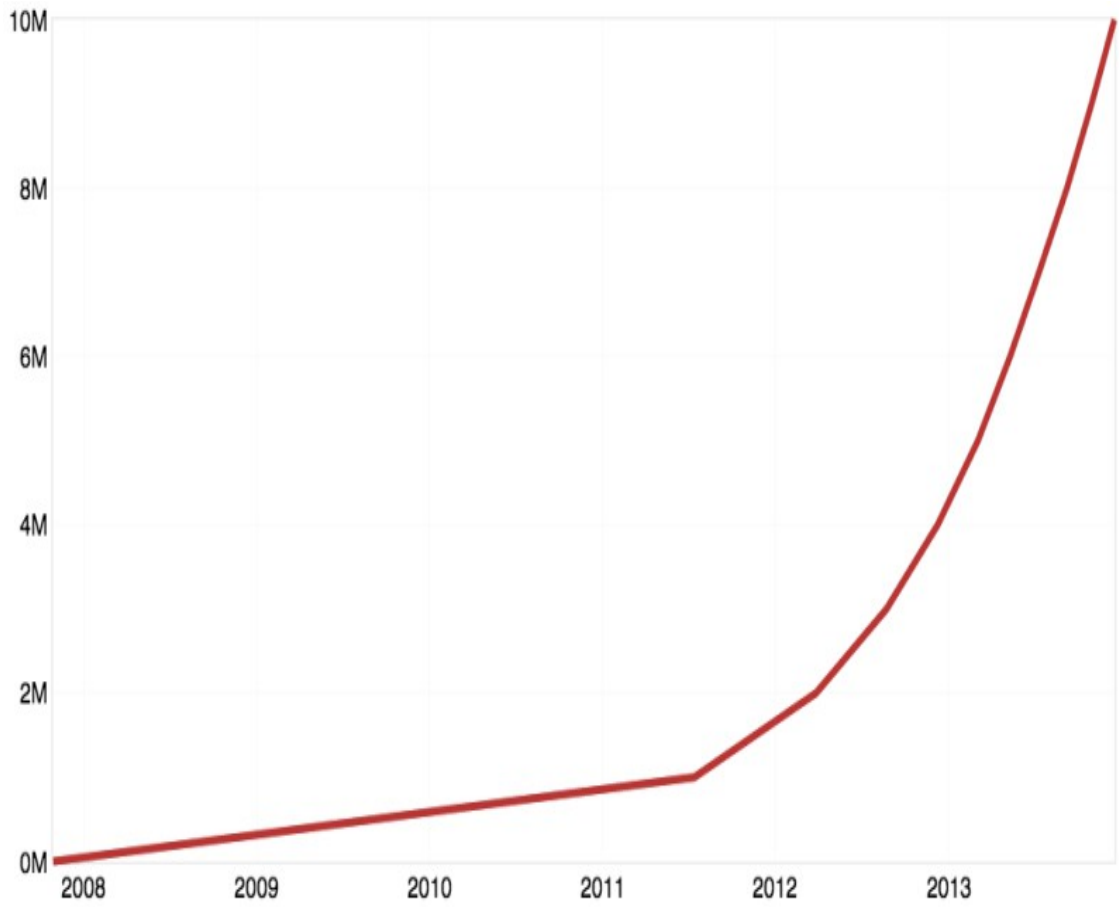
Fig 1 – Graph of no. of people playing fantasy team games over years

1.4 Methodology :

The procedures carried out in the project are as follows-

I. New user would be asked to sign up to score heroes once he visits the homepage.

II. Registered users would be asked to log in straightaway

III. Create team will give the list of players available for selection

IV. Upon selecting their teams, users would have to save their team

V. They would have an option to join some leagues or create a new league

VI. Once a matchday is over, users will get to see their total points in total points section

VII. Total points from each match weeks will accumulate to determine seasons standings

VIII. Only one team can be made using one email. However, a single user can make 5a side or 11 a side teams using his account

IX. For those who wish to start their own league can choose the option of create league from the top navigation bar.

X. Type of league and number of maximum players need to be mentioned before clicking the Submit option else by default it will be a 11a side league of maximum 10 players in the league.

Fig 2 - sample XI of football fantasy league

In the event that a specific player is inaccessible, we will inform the client and that player would not be accessible for choice methodology. In the event that by chance that player was not transformed, we would make programmed substitutions after the amusement week is finished. Biasing towards a specific player is an issue clients require not to stress over in light of the fact that Ruby script will get the official information from authority sites. So everything from guide derivation toward getting extra focuses will all be done in a straightforward manner. Back end of PHP and Maria Database's security will guarantee that no information is lost amid the continuous techniques and everything is refreshed each week.

1.5 Organization :
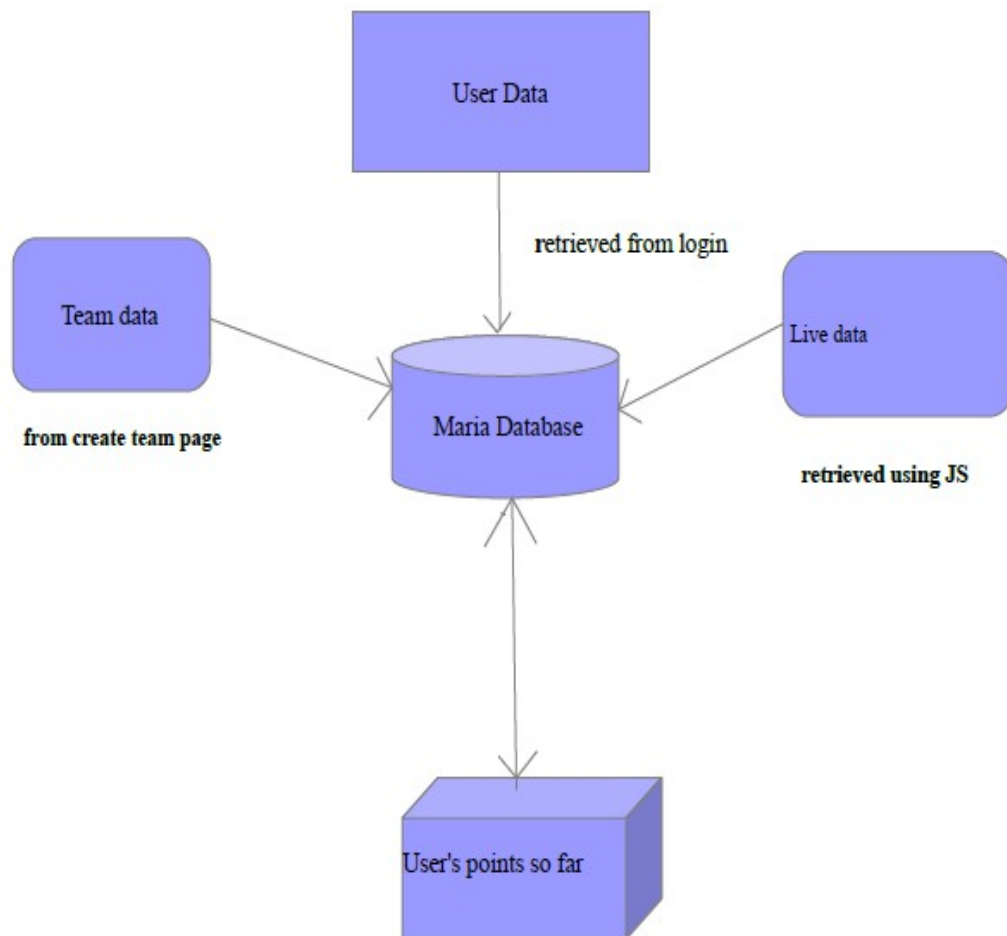
Fig 3 - organization of application

Organization of the whole web application can be seen above. The whole explained version of this structure provides you the complete picture of the web application. The database is Maria Database which is the core part of this application. Every other aspect of the application is related and works structurally with respect to database.

Firstly, the user data is to be stored and maintained in the database which is retrieved by the login form. The verification of the users is also done with the help of information provided by

database. The whole data insight provide to user through the whole working of the application goes on is stored in database.

The information that is stored in database required for the users is live scrapped from the different websites which provide statistical data and insights of the sports. This live data implies that data and information has to be updated every now and then. This part of process is really very vital part that is necessary for the working of the application.

Every other data that is created like user's team and number of players available and different leagues in the playing are stored in the database. One of the most important things that is competition of points between the users is not only stored by database but also with other information stored it helps to maintain those point tally. This is basically summarized version of how all the aspects of this application are organized.

Chapter-2 LITERATURE SURVEY

2.1 Fantasy League Description :

For more than fifty years Fantasy Football has made a deep impact on numerous football fans and has become an obsession. The basic origin of this game was through newspapers, where fans have to check every Monday newspaper for scores and player's statistics and calculate manually throughout the league season. With the recent advancement of technology, the procedure has also evolved and become more interesting. In the last five years this game has advanced so much that it has provided opportunities for many of the fans to be more passionate about their game. These days we can see that Fantasy game is involved in many of the team sports. There are different fantasy leagues like for basketball there's one with NBA and for cricket we have dream11 and there are many football fantasy leagues with each of the different leagues we have in the world such as Fantasy Premier League.

Fig 4 : Various fantasy leagues

The history of fantasy sports goes as. The thought was imagined in 1962 by Bill Winkenbach, a businessperson and part-proprietor of the Oakland Raiders. Oakland Tribune sportswriter Scotty Stirling, Raiders' advertising executive Bill Tunnell, and Winkenbach met in a New York lodging to make a lot of guidelines. Here, the Greater Oakland Professional Pigskin Prognosticators League, or GOPPL, was conceived. The next year, the main alliance started with eight groups and a draft occurred in the storm

cellar of Winkenbach's home. In evident dream football style, the No. 1 generally pick, George Blanda, was a failure. The proprietor who chose him with the first-historically speaking dream football pick, completed toward the end in the alliance. The amusement took off when Andrew Mousalimas, a bar administrator and one of the first GOPPL proprietors (likewise the person who made the Blanda pick), opened up another bar in Oakland a couple of years after the fact and began another alliance there, as per Time. It was there that Mousalimas modified the principles from the first group to make them progressively multifaceted, a style that present dream proprietors would be increasingly acquainted with.

By 1974, Mousalimas had around 200 players required, with an all-female division set up by 1980. The diversion kept on picking up fame essentially through verbal exchange and different games correspondents. Quick forward to 1997, CBS.com propelled their first form of the diversion, free for any individual who needed to play. As one could envision, it was a moment hit and on the cusp of turning into the multi-billion dollar industry that it is today.

Dream football turned into the motivation for comparable diversions among the other significant games. Dream investigators began to develop and wind up well known on outlets like ESPN. By September of 2006, more than 18 million individuals in the U.S. were playing dream football.Now why are these game so popular and competitive when there is not much of playing is done by users themselves. Well basically these games were created by fans who were very much passionate about games and who were playing in those game and how well they performed, they even thought that they knew more than actual managers in games. It was that time that they started to create their own teams and compete with each other that who picked the best team. This is how basically this game started and now we have much more than that added to these games to make it more interesting on the basis of statistics. These days we have many fantasy league games based on different sports and according to that sport each game has different rules but there is one thing common in all fantasy games

that user get to pick his own team and watch over the scores and performance of his players every other weekend and manages them on the basis of their performance. According to the performance of these players in their actual matches the users earn points and the user with the best total of all others gets to be on the top. Now these is not just for the whole season basically it is only for one weekends matches and each weekend we have new winner and after that users get to pick their team again for the next week. Now there are much more different types of modes in which you can pay this game each fantasy game has their own.

2.2 Fantasy Leagues in Football :

Now our project focuses more on the Fantasy Football so it has a bit of modifications and changes for players. Now in Football we have five major leagues:

⸎ • Premier League in England

⸎ • LaLiga in Spain

• Bundesliga inn Germany

• Ligue 1 in France

• Serie A in Italy

Fig 5 - different European leagues

Now each of these leagues have their own official Fantasy games where users get to pick players playing in their league and form a team and just like any other Fantasy games users play on the weekly basis. Now each of these games have different analytical approach to calculate scores like how much a player gets when he scores a goal or kept a clean sheet or made some key passes and assists and no of interceptions made by player or dribbles completed or more. There are different key values upon which a player's scores are calculated.

For example, in FPL we have following point system for the player's performance:

- Playing for 1-60 minutes, 3 points

╲• Playing for more than 60 minutes,6 points

╲• Midfielders scoring a goal,18 points

╲• Forwards scoring a goal,24 points

╲• Assists,9 points

╲• Goalkeepers and defenders keeping clean sheet,12 points

╲• Saving a penalty,15 points

╲• Save,2 points

╲• Creating a big chance,3 points

╲• Key pass,1 point

╲• Successful tackle,2 points

╲• Successful dribble,1 point

╲• Conceding a penalty, -3 points

╲• Yellow Card, -3 points

∖ • Red card, -9 points

∖ • Own goal, -6 points

∖ • Being tackled, -1 point

∖ • Conceding a foul, -1 point

∖ • Being caught offside, -1 point

Basis on above the players earn point in FPL for users.

Now users can play either with every other user in this game or there is another additional option available where a group of users can play with only each other.

Now Basically in these all games there are only players associated with their own league. Our project focuses on more where we can combine all the players of top five leagues and user can pick any one from any league into their team. Basically the ideology is to provide a different kind of dynamic and excitement to the game.

Covering all the players and their performance in different leagues for users who have picked players from different league is a bit difficult as every other league has different approach to calculate points of a player. So we have to apply different approach common to all the leagues so that there will be no conflicts in calculation of the points. The algorithms for that will be

discussed in the next chapter. Most of the data will be same except some point system based on different leagues.

There will be also many leagues in which a user can play as our project mainly works on providing options with different leagues so it is up to user whether they want to play with all players of different leagues or they just want to play in one league. These options will be provided to users whether they want to players with all leagues or just one or more than one like just from two leagues. Basically the project is about to provide different options to users to play with different players as they want.

2.3 Evolution with technologies :

With the advancement of technologies there are various ways in which these fantasy sports can be modified and implemented in many other ways including several variables and factors. A lot of learning techniques can be implemented to enhanced the ways of selecting a better team with much more productive players. Analyzing the plays of different players and their health conditions which can create an impact on the game.

The statistical data provides a lot of information about which players should be traded and under what circumstances a player is much more productive. There are several different ways through which all these statistical data can be collected. For instance if a player is in a form of good games his chance of selection should be much higher than other players. Also if there is a player who is going through injury crisis, there should be proper data available about that player whether he should be selected or traded. The data also helps to tell about the productivity of player if he is returning from a long time injury. Data provide an estimate about how much time a player can be injured.

Another processes that comes into play like with the help of artificial intelligence and machine learning techniques a lot can be deduced about players. While there is a ton of expectation and likelihood associated with this procedure, there is additionally vulnerability. This is the place a hazard evaluation becomes an integral factor.' 'Players regularly are harmed or exchanged, making it progressively hard to foresee. Measurements, by definition, is the study of estimating, controlling and conveying vulnerability, and with the measure of inconstancy in dream football, it's insightful to depend on measurements to settle on winning choices.

So there's a lot that can be technologically implement in the fantasy sports like as explained above. Extracting data statistically and implementing it through the techniques of machine learning and artificial intelligence. But our project do not cover this aspect of the fantasy sports.

2.4 Technologies Implement :

Application such as these fantasy games works according to the users request and the way in which they want to proceed. So there is more requirement to make the application more dynamic and handle some certain events. To work in a dynamic way, some certain user events like selectins a portion of area or entering text, there need to associate some action with these events. There have been many ways over the years to implement this kind of technology.

One of the ways is provided by Common Gateway Interface to implement this technology between server side and client side, which is basically responsible for sending and receiving information between two sides. The CGI part on the server contains little projects considered contents that take data from the program framework or give it to show. A straightforward content may ask the per user's name, decide the Internet address of the framework that the peruser uses, and print a welcome. Contents might be written in any programming dialect, be that as it may, on the grounds that they are commonly straightforward content preparing schedules, PC scripting dialects, for example, PERL are especially proper.

Different methodologies can be used to execute this process. One of the method is to create an web app which directly extract data from different sources. Our implementation of this part of project is done with the help of ruby programming language.

Since its open discharge in 1995, Ruby has drawn given coders around the world. In 2006, Ruby accomplished mass acknowledgment.

With dynamic client bunches framed on the planet's real urban areas and Ruby-related gatherings completely filled. Ruby-Talk, the essential mailing list for exchange of the Ruby language, moved to a normal of 200 messages for every day in 2006. It has dropped lately as the measure of the network pushed talk from one focal rundown into numerous littler gatherings. In Ruby, everything is an object. All of data and code can be given their own properties and activities. Object oriented programming calls properties by the name case factors and activities are known as techniques. Ruby's unadulterated item arranged methodology is most usually exhibited by a touch of code which applies an activity to a number.

Ruby is viewed as an adaptable language, since it enables its clients to openly change its parts. Fundamental pieces of Ruby can be expelled or re-imagined, voluntarily. Existing parts can be included upon. Ruby does whatever it takes not to confine the coder.

Blocks in ruby are truly an expensive feature. Ruby's blocks are additionally observed as a wellspring of extraordinary adaptability. A developer can join a conclusion to any strategy, depicting how that technique should act. The conclusion is known as a block and has turned out to be a standout amongst the most famous highlights for newcomers to Ruby from other basic dialects like PHP or Visual Basic.

Ruby, as a language, has a couple of various executions. This page has been examining the reference execution, in the network frequently alluded to as MRI ("Matz's Ruby Interpreter") or CRuby (since it is written in C), yet there are likewise others. They are frequently helpful in specific circumstances, give additional coordination to different dialects or situations, or have extraordinary highlights that MRI doesn't.

Other few implementaions of ruby:

∖ • JRuby is Ruby on the JVM (Java Virtual Machine), using the JVM's enhancing JIT compilers, city workers, simultaneous strings, instrument biological system, and huge accumulation of librariesRI doesn't

∖ • Rubinius is 'Ruby written in Ruby'. Based over LLVM, Rubinius sports a clever virtual machine that different dialects are being based over, as well.

∖ • TruffleRuby is an elite Ruby execution over GraalVM.

∖ • mruby is a lightweight execution of the Ruby language that can be connected and implanted inside an application. Its advancement is driven by Ruby's maker Yukihiro "Matz" Matsumoto.

∖ • IronRuby is an execution "firmly coordinated with the .NET Framework".

∖ • MagLev is "a quick, steady, Ruby execution with coordinated item perseverance and appropriated shared store".

∖ • Cardinal is a "Ruby compiler for Parrot Virtual Machine"

Web Scraping and web crawling

The main part of executing these applications is to extract information required to process all the computations. The data set needs to extracted from different sources available on internet or from any other source. This methodology generally is known as Web Scraping. It is also refer by many other terms such as Web Harvesting, Web Data Extraction, Screen Scraping etc.

Information shown by most sites must be seen utilizing an internet browser. They don't offer the usefulness to spare a duplicate of this information for individual utilize. The main alternative at that point is to physically reorder the information - an exceptionally monotonous activity which can take numerous hours or at times days to finish. Web Scraping is the system of computerizing this procedure, so that rather than physically duplicating the information from sites, the Web Scraping programming will play out a similar assignment inside a small amount of the time.

Fig 6 - a web scraping process

There is always a discussion between the web scraping and web crawling and there are lot of points that can clear those differences.

\ • In straightforward terms, Web slithering is the procedure of tediously finding and getting hyperlinks beginning from a rundown of beginning URLs. Extensively, Web Crawling is the way toward finding data on World Wide Web(WWW), ordering every one of the words in a record, adding them to a database, at that point following all hyper connects and files and adds that data likewise to the database.

\ • A web crawler is a product program that visits sites and peruses their pages and other related data
so as to manufacture passages for a web index list. The significant web
\ crawlers like Google, Yahoo, Bing and so on the Web all have such a program, which is otherwise called a "web creepy crawly" or a "bot."

\ • In basic terms, Web scratching is the procedure of consequently mentioning a web report and gathering data from it. Carefully, to do web scratching, you need to do some level of web slithering to move around the sites.

• Web Crawling would be for the most part what Google, Yahoo, Bing and so on do, scanning for any sort of data. Web Scraping is basically focused at explicit sites for explicit information, for example for securities exchange information, business drives, provider item scratching and this are for the most part given by web scratching

Web Scraper would be doing things a good web crawler wouldn't do, i.e.:

𝄔 • Doesn't obey robots.txt

𝄔 • Submit forms with data

𝄔 • Execute Script

𝄔 • Transforming the data into required form and format
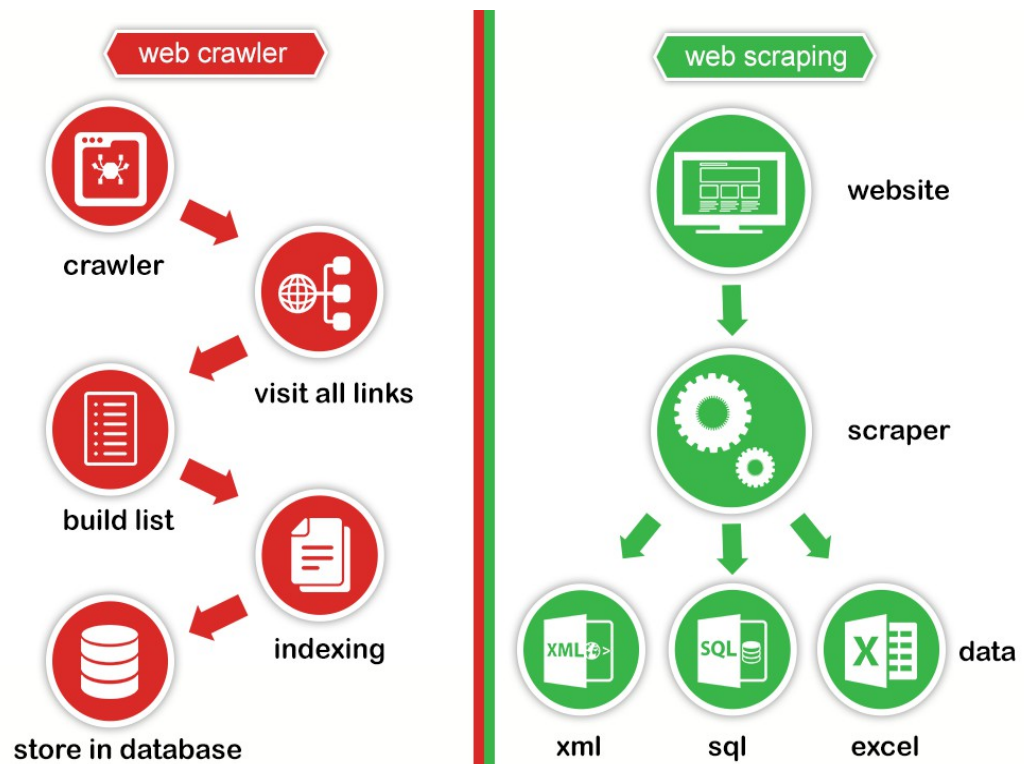
𝄔 • Saving extracted data into database

Fig 7 - difference between web scraping and crawling

2.5 Research Papers and books :

There are lot of challenges in developing a fantasy league web app and there have been a lot research done on various factors on challenges faced and what are those challenges. A paper on this issue by Richard Tacon Fantasy Sport : A systematic review highlights some of the challenges. Each challenge faced is handled systematically.

One of the main challenges is to get data from the third party data provider and actually maintain it. There are many fantasy sports information suppliers which offer continuous games content over different games. They are serving dream information to numerous online dream sports merchants, media and versatile customers around the world. They gather and appropriate the quickest and most precise information which are accessible in simple arrangements. Dream Data suppliers are putting forth far reaching substance to dream new businesses and endeavors hence taking into account the requirements of organizations and enterprises over the globe.

Some of other challenges highlighted by blog of algoworks:

\• There are many dream sports information suppliers which offer ongoing games content over different games. They are serving dream information to numerous online dream sports merchants, media and versatile customers around the world. They gather and disseminate the quickest and most exact information which are accessible in simple arrangements. Dream Data suppliers are putting forth exhaustive substance to dream new businesses and undertakings along these lines obliging the necessities of organizations and ventures over the globeWhile nerd bots are capable in their very own specialized space, they really face learning of amusement subtleties as an extraordinary test. Understanding the Fantasy Sport requires parcel of mental bent and improvement and testing field appears combat zone to them. They effectively acclimatize all the gaming methodology and it appears that they are through the difficulty. A profound comprehension of the amusement is required for Fantasy Sports App Development as the dream sports gaming improvement is altogether different from online multiplayer diversion advancement. Knowing techniques and situations in Fantasy Sports Gaming improvement is by and large extraordinary and ungainly contrasted with the real game. To actualize the situations, hits, head slaughters, procedure takes a great deal of drudge and diligent work amid the advancement and obviously amid testing

╲ • Fantasy Sports App advancement manages tremendous information and subsequently information coordination and reasonable separating expends part of time. Exertion is required conflicting information combination and blunder free information filtration. There is enormous information identified with number of players, their scores, their physical properties and so on which requires homogeneous information unification and sharp filtration.

In recent years there have been many researches about methods of web scraping and how to analyze the advantages and disadvantages of those methods. From a research paper of Web Scraping Data Extraction from websites have been since 2000 and there are basically two mostly used technologies.

The Document Object Model (DOM) turned out to be more mainstream in DHTML. A more extensive acknowledgment later on permitted the HTML Parsing procedure to advance to DOM Parsing.

Second precedent are Application Programming Interfaces (APIs). This method is the most youthful on the rundown, the development of accessible substance APIs is dated from 2005.

As per ProgrammableWeb.com the quantity of APIs includes developed inside 8 years from 0 to 10302.

A book written by Jacob Ward defines way of using APIs to implement Web Scraping. It defines the important advantages of using APIs.

While the past strategies work to rub comprehensible yields, Application Programming Interface(API) expects an application as a correspondence accomplice. Accordingly, APIs are regularly named as machine-coherent interfaces (versus comprehensible).

Indeed, even APIs were presented a lot later than the WWW, and their development was quick. The universe of APIs is divided.

For a straightforward diagram and introduction were API Directories made. The greater part of the accessible APIs are enrolled and depicted in the index with important connections to the sources. Two instances of such indexes are - Programmable Web (https://www.programmableweb.com) and APIs (https://apis.guru/).

There are other ways to perform web scraping although not much of them are famous as much ways through APIs. These methods were highlighted through a publication of Apress in 2009,Scripting Intelligence.

\ • HTML Parsing : Sites don't generally give their information in agreeable organizations, for example, .csv or .json records. HTML Pages are made by the server as a reaction to a client's solicitation. Now server programming isn't significant, rather the yield in the program is significant. Examination of the HTML structure (straightforward page test gave in the Figure 3) in the gave site page will indicate rehashed components. With a programming language content or Web Scraping apparatus, each page with comparative example can be utilized as a hotspot for information.

\ • DOM Parsing : Document Object Model (DOM) Parsing is an advancement of HTML Parsing dependent on improvements of the language and programs which lead to the presentation of the Document Object Model. DOM is intensely utilized for Cascading Stylesheets (CSS) and JavaScript. Mix of DOM uncovered new potential outcomes for tending to some particular pieces of the website page. Figure 4 demonstrates holders with their very own DOM addresses. These are utilized in Web Scraping for simpler route through page content.

Chapter-3 *SYSTEM DEVELOPMENT*

3.1 System Architecture

Basically this project application is constructed upon different layers and those layers will interact with each other to perform the operations of this application. So starting with the first one we have a layer of user interface constructed with the help of Bootstrap and Script written in Ruby. This layer will basically help the user to interact with the different features of the application. Next we have layer of php application for backend operations to be performed. Main objective of this layer is to provide connection between the first layer and the last layer of database. This second layer will be responsible to provide data from database to the user layer and manipulating database for any changes or storing data for users in the database. The third layer which is the most important layer of the application is database layer. This layer is basically responsible for storing all the data related to application. The data set for our application which will be required for performing calculations will be stored in this database layer. The user data like players picked by specified user, their points and every other data that has to be computed and stored will be in this layer. For our application the database layer is the most important layer as it will provide the very requirement of this project i.e. the player's data.
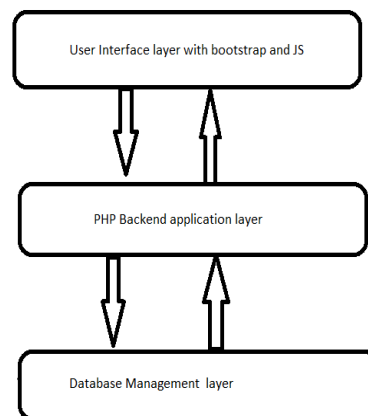
Fig 3.1

Fig 8 - different layers of this application

3.2 Experimental Model :

Now Basically in our application the manner of competition is totally dependent on how user wants to play in this application. It will be decided by the user from the options provided by us whether he wants to play combined with all leagues or just one specific league and the amount of competitors he wants to play with. Our whole system operations or the way in which our application will work for a specific user will be decided by user.

For an instance let's suppose that a user signup in our application so basically the first operation will be getting data entered from user and storing in the database. In this case first the user layer will interact with php application to provide data. Then the second layer will process the data and store it into database by interacting with third layer. Now the username and password are stored in the database and will be compared anytime user wants to login into our application.

After the user has log in to our application two options will be provided to the user. Depending upon those options the backend application will fetch data from database from third layer and that data will be presented through user interface layer. This whole process is based upon the interaction of three layers with each other. Then we have a choice whether the user wants to create his own league or as we call it draft league with limited number of users or play with every other user. If the user wants to create his own league, then a code will be generated for user to send invites to other user. Now we have two more options for the user to choose, play with 5 side team or 11 side team. Then the user gets to pick the players.

We have seen how the user interface layer works with user but there are more complicated procedures going along with second layer and third layer. Now we have to keep in mind that user can play in multiple modes, so depending upon his options the php application will communicate with database layer to create separate tables for user for different game modes. In these tables we will store all the user related data of application.

Like if user is playing in draft league and also in normal league then there will be separate data sets for user stored.

Talking about draft league in this we management of data set separately than other league mode. In this firstly a invite is sent from the user to other users, all those users who are playing in this are associated with that specific user who created this league. The Database will have separate tables created for this league mode and users associated with it. Now the data set of players for this league will work in a different way. Each user will have to wait for their turn to pick a player and once a player is picked by one user then it will not be provided to any other user. Each user will get a specific time period for picking players in one turn and can only pick 1 player at a time. In this the php application will work with different methodology with the database layer. As a player is selected by a user the php application will eliminate that player from the data set of players that are available to be picked. Also as the user selects a player the selection window is then provided to the next user and time period of next user will start. If suppose user A somehow misses the chance of picking a player, then again the selection window will be transferred to next user and user A will get an extra chance after all other users have their turns completed.

Now discussing about the working of normal league which I much different from draft league here the users will be competing with every other users of application playing in that league. Unlike draft league the normal league is not just associated with one user. So in this league there is no such methodology that only one user can have a specific player. For example, any number of users can have same player or can also have same teams selected. There is no concept of selection window and time period in the selection of players. All users can select a squad depending on whether they are playing with a five side team or eleven side team.

The winner of the game will basically be decided on one rule that is the user with more number of points will win the competition for a weekend.

Each user will have a selected amount of budget provide to them and according to that budget they can select the team or pick the players. Also players will also a certain price associated with them. The price will vary from one player to another, so the selection of the players has to be done carefully, as with the given amount of budget the user will have to select a whole squad.

Now let's take an example according to above methodology of the working of the application. The user will login to the application and selects the league in which he wants to play. Considering the user selects to play in normal league, then come the option of selecting whether a five side team or eleven side team. The user selects eleven side then proceeding to the next step the user picks up 15 players of which he can only play eleven players and rest of the others are substitutes. After that the user has finalized its team for the upcoming matches all the user has to do is to wait for the results. If the user has picked up 5 side team the again same procedure just the number of players to be selected are eight of which five players are to be played and the rest are substitutes.

If the user wishes to play in draft league, then the first procedure will be creating a league or joining some other user's league. Let say user A creates a league and then he invites another 5 players to join the league, then after the users have joined the selection procedure will be started with time period of two minutes per user. Now each user will have 15 or 8 turns depending on whether they are playing with five side team or eleven side team. Ever user will pick the players when their turn comes, from data set of players who are available in the selection window. Remember in this league no users can have same players. Now according to the procedure they will wait for the weekend matches results and then the winner will be decided.

3.3 Behind the scenes

Web scratching, web reaping, or web information extraction is information scratching utilized for removing information from websites.] Web scratching programming may get to the World Wide Web specifically utilizing the Hypertext Transfer Protocol, or through an internet browser.

While web scratching should be possible physically by a product client, the term regularly alludes to mechanized procedures actualized utilizing a bot or web crawler.

It is a type of replicating, in which explicit information is assembled and duplicated from the web, ordinarily into a focal neighborhood database or spreadsheet, for later recovery or investigation.

Web scratching a site page includes getting it and removing from it. Fetching is the downloading of a page (which a program does when you see the page).

Subsequently, web creeping is a fundamental part of web scratching, to bring pages for later handling. Once brought, at that point extraction can occur. The substance of a page might be parsed, looked, reformatted, its information replicated into a spreadsheet, etc. Web scrubbers regularly remove something from a page, to make utilization of it for another reason elsewhere. A model is find and duplicate names and telephone numbers, or organizations and their URLs, to a rundown (contact scratching).

Web scratching is utilized for contact scratching, and as a segment of utilizations utilized for web ordering, web mining and information mining, online value change observing and value correlation, item survey scratching (to watch the opposition), assembling land postings, climate information checking, site change identification, inquire about, following on the web nearness and notoriety, web mashup and, web information joining.

Site pages are constructed utilizing content based increase dialects (HTML and XHTML), and habitually contain an abundance of valuable information in content shape. Nonetheless, most pages are intended for human end-clients and not for simplicity of mechanized utilize. Along these lines, toolboxes that rub web content were made. A web scrubber is an Application Programming Interface (API) to remove information from a web.
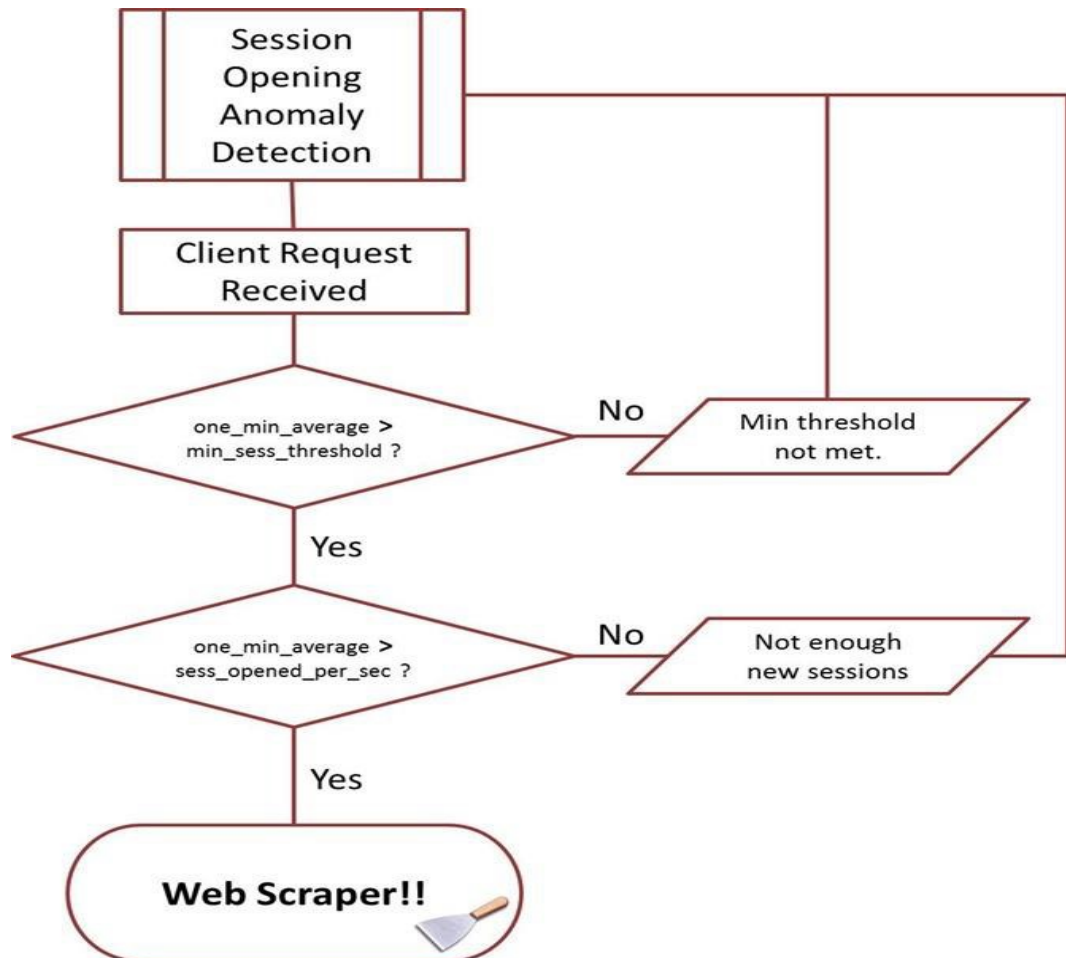
Fig 9 - A web scraping algorithm

Web scarping in this application has been done with the help of ruby programming language. Ruby performs it web scraping parts with the help of nokogiri which is basically a web scraping gem. Among different highlights, it enables you to seek HTML archives by CSS selectors. That implies on the off chance that we know the ids, classes, or even kinds of components where the information is put away in the DOM, we're ready to cull it out.

Another component required to perform this operation is httparty. HTTParty is another Ruby library by John Nunemaker (of railstips.org distinction) that makes it a snap to manufacture classes that can utilize Web-based APIs and related administrations.

At its least complex, you incorporate the HTTParty module inside a class, which gives your class a "get" technique that can recover information over HTTP. Further orders, be that as it may, educate HTTParty to parse results (XML, JSON, etc), characterize base URIs for the solicitations, and characterize HTTP validation data.

Explaining the working of this whole process of using nokogiri and httparty it breaks down as:

∖ • Firstly, with the help of httparty we get the whole document or web site from which data is to be scraped in one doc element through get function of the httparty.

∖ • Then the next step is to parse the whole page with the help of nokogiri and through this parse page we can access different elements of the web site.

∖ • .at function of nokogiri parsed pages is the one through which we are going to access elements like tables through which we can extract our required information

∖ • Next step is to write separate functions for the different types of accessed elements and store them at your database

Chapter-4 ALGORITHMS

There are not much of complex algorithms involved in this application as the working of the application is rather simple. The different algorithms we have are of login and signup, selecting team or team creation, scraping of live data from web sites, backend algorithm for retrieving data from users and providing live data scraped for the process of selecting teams.
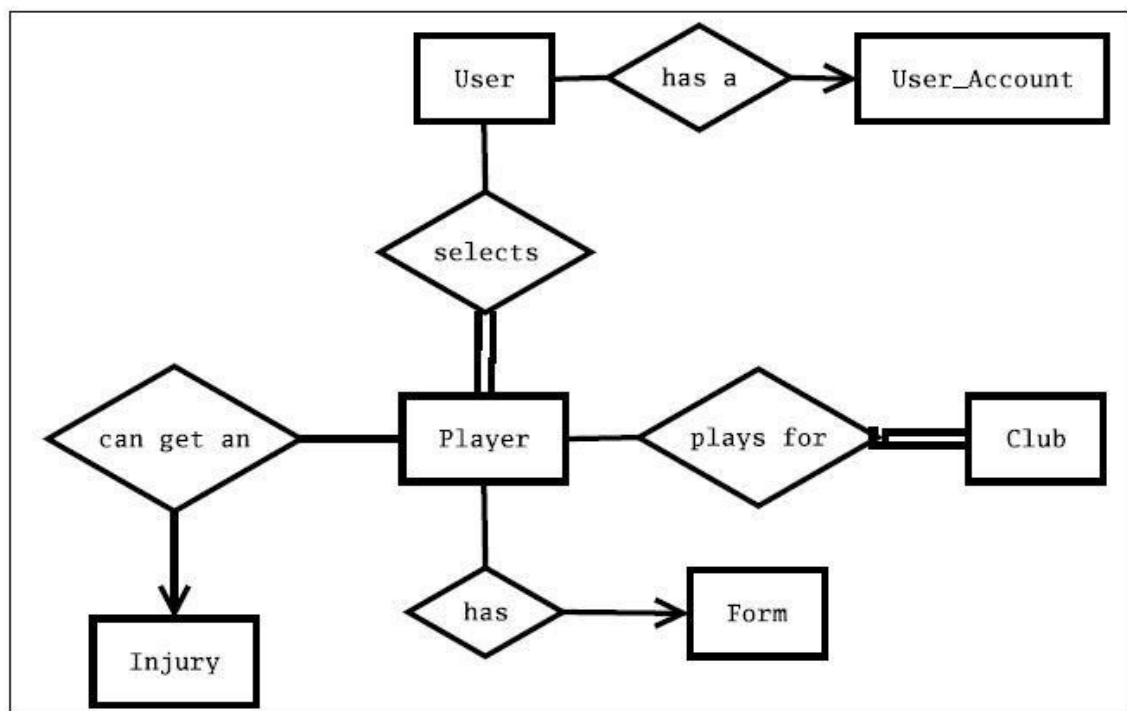
Fig 10 - ER diagram showing database functioning

Algorithm 1-User Registration

User.clicks (register now)

      -> User fills his details

-> PHP checks if all entries are valid or not

-> If true, add user to the database

-> If false, give an error message

Algorithm 2-User Login :

User.clicks(login)

->User fills email and password

->PHP checks if user is present in database

-> If true, navigate to website's homepage

-> If false, give an error message

->end

Algorithm 3- Create team :

->User sees all available players in the list

->User Clicks (add player)

->Count(player) gets incremented

->Player gets added to the user.team

->PHP checks if count<team capacity

-> If true, ask to save team

-> If false, save team cannot be clicked

->end

->end

Algorithm 4- Create league :

->User Clicks(create league)

->User selects an option from the two types of leagues

->If 5a side selected

->Set Count MAX=5

<div align="center">

-> else

->Set Count MAX=10

</div>

Algorithm 5-Displaying various data in sorted manner

We could have used some best sorting algorithms available but we preferred to display soreted data using MySQL queries.

Query- SELECT * FROM PLAYERS ORDER BY POINTS

Algorithm 6-

Web Scraping Through Ruby

Code:

```ruby
require 'httparty'

require 'nokogiri'


require 'csv'
class Scraper

    def initialize
doc = HTTParty.get("https://www.foxsports.com/soccer/stats?competition=1")
@parse_page ||= Nokogiri::HTML(doc)
```

<div align="center">

-34-

</div>

```ruby
 end

def parse_page

    @parse_page
end

def get_data

@array_of_tables = []
@parse_page.at("#wisbb_rankings").search('table').each do |el|
   @array_of_tables << el

end

    segregate_data
    write_data_to_csv


end

def segregate_data


    get_goalscorers
    get_assisters
    get_offenders
    get_keepers

end
```

```ruby
def write_data_to_csv

  write_goalscorers
   write_assisters



   write_offenders
   write_keepers

  end

private

  def get_goalscorers


    @goalscorers = []
    @goalscorers_values = []
    table = @array_of_tables[0]
    names = table.search(".wisbb_leaderName")
    values = table.search(".wisbb_leaderValue")

    values.each do |value|
      @goalscorers_values << value.text
    end

names.each do |name|
    @goalscorers << name.text
end

end

def get_assisters

  @assisters = []
  @assisters_values = []

table = @array_of_tables[1]
names = table.search(".wisbb_leaderName")
values = table.search(".wisbb_leaderValue")
```

```ruby
values.each do |value|
    @assisters_values << value.text
end


names.each do |name|
    @assisters << name.text
  end


end


def get_offenders


    @offenders = []
    @offenders_values = []
    table = @array_of_tables[3]
    names = table.search(".wisbb_leaderName")
    values = table.search(".wisbb_leaderValue")


    values.each do |value|
      @offenders_values << value.text
    end



    names.each do |name|
      @offenders << name.text
    end



end
```

```ruby
def get_keepers


    @keepers = []


@keepers_values = []
table = @array_of_tables[4]
names = table.search(".wisbb_leaderName")
values = table.search(".wisbb_leaderValue")


values.each do |value|
    @keepers_values << value.text
end


names.each do |name|
    @keepers << name.text
  end


end


def write_goalscorers


    goalscorers_csv = CSV.open("goalscorers.csv", "a+") do |row|
      row << @goalscorers
      row << @goalscorers_values
    end
```

```ruby
  end

def write_assisters

        assistsers_csv = CSV.open("assisters_csv.csv", "a+") do |row|
          row << @assisters
          row << @assisters_values

  end


  end

def write_offenders

        offenders_csv = CSV.open("offenders_csv.csv", "a+") do |row|
          row << @offenders
          row << @offenders_values
      end

end

def write_keepers

        keepers_csv = CSV.open("keepers_csv.csv", "a+") do |row|
          row << @keepers
          row << @keepers_values
        end


    end


end
```

sc = Scraper.new

sc.get_data

This code scrapes the data from the website and extract the data and store them into .csv files.

CHAPTER 5: TESTING

Testing so far has been done on two calculations i.e. login and information exchange and making group. The scope of sources of info don't fluctuate such a great amount in these two calculations. Along these lines, just testing required is in entering of Name, Email and secret word in depicted way
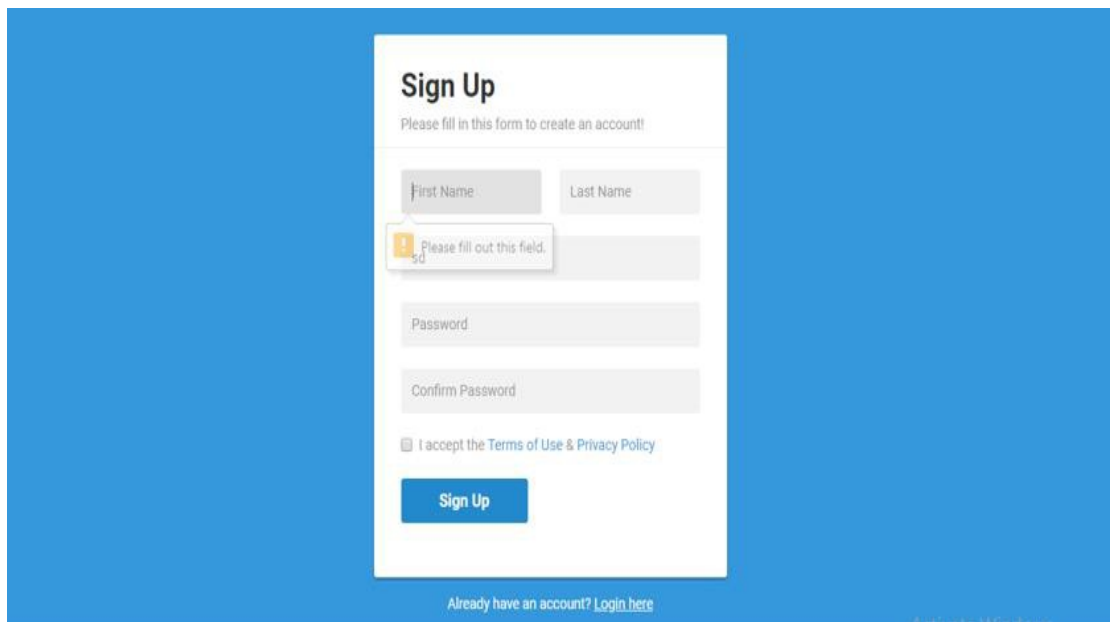
Fig 11 - Testing of signup form

INPUT – Email : sd

OUTPUT – please fill out this field
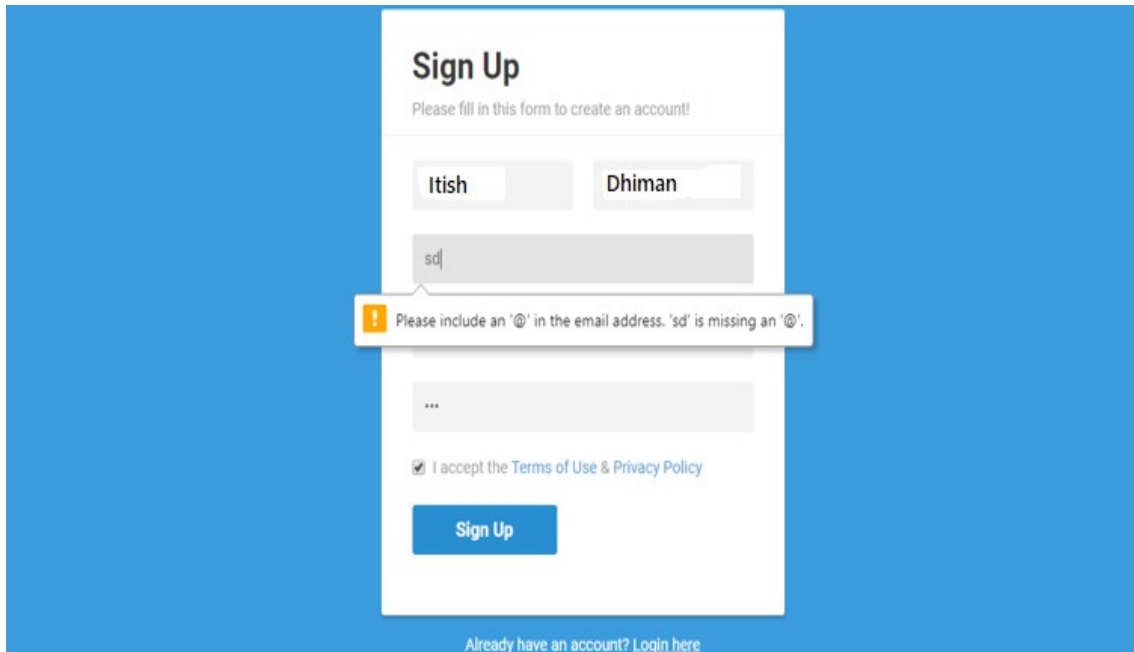
Fig 12 - Testing of signup form

INPUT- email sd

OUTPUT – please include an @ in the email address.

Next phase of testing was done on whether selected players by users are actually being added to their team or not.

the data set provided for users scraped from website :

	A	B	C	D	E
1	ID	Name	Position	Points	
2	1	David De Gea	GK	9	
3	2	Ederson Moraes	GK	7	
4	3	Alisson Becker	GK	8	
5	4	Thibaut Courtois	GK	6	
6	5	Kasper Schmeichel	GK	7	
7	6	Rui Patricio	GK	4	
8	7	Hugo Lloris	GK	5	
9	8	Jordan Pickford	GK	6	
10	9	Bernd Leno	GK	3	
11	10	Nick Pope	GK	5	
12	11	Cesar Azpilicueta	DF	9	
13	12	Antonio Valencia	DF	7	
14	13	Ricardo Pereira	DF	8	
15	14	Kieran Trippier	DF	6	

Fig 13 - data set for the database
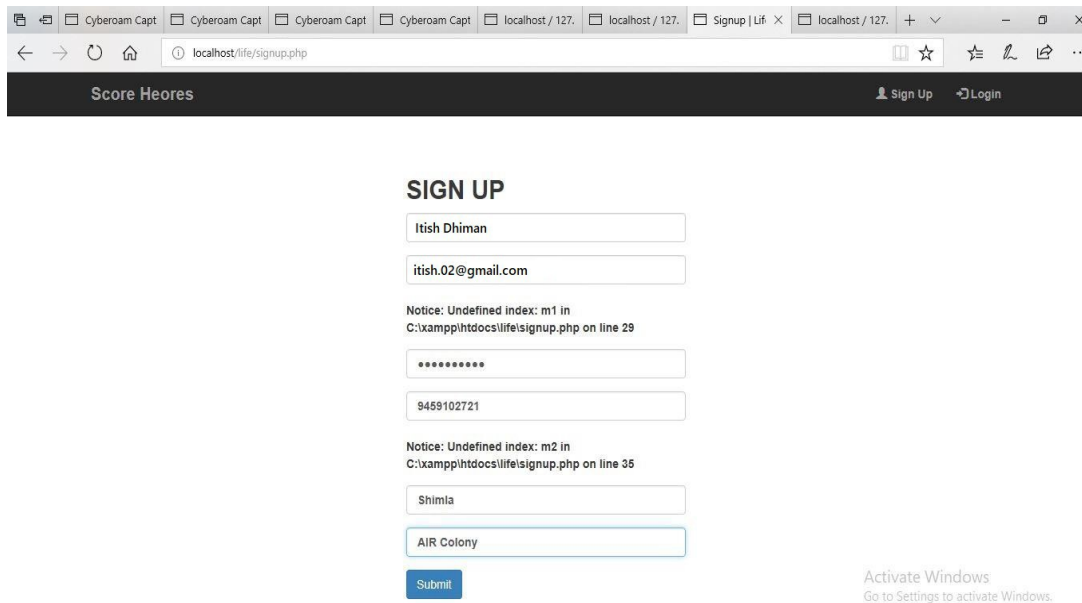
Fig 14 - data set for database

CHAPTER 6: RESULT AND PERFORMANCE ANALYSIS

Results

One of the results we are getting successfully after completing the process of application was that users that have signed up for this application have been added successfully to the database.

the result is shown below of the above operation.
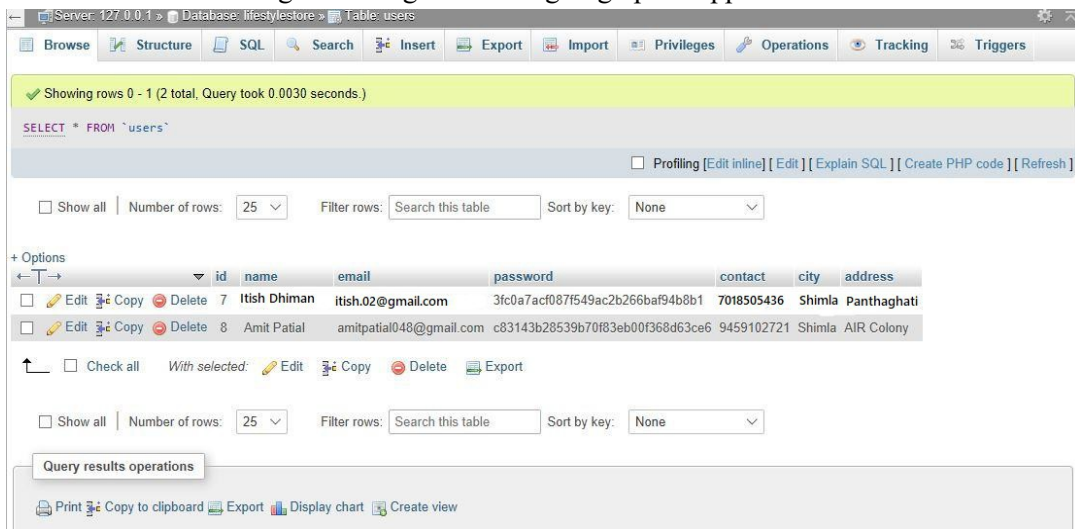
Fig 15 – image of user signing up for application

Fig 16 – web scrapping of data

Successfully scraped the data from the website which is required for the execution of this application. The scraped data from the sites is shown below

fig 17 - database with data scraped from web site

Chapter 7: Conclusions

The principle target of this task was to execute web scratching of player information from confided in sources which we have done effectively by actualizing it utilizing scripting language ruby. The approvals of the clients playing the amusement was done effectively.

The UI was actualized effectively utilizing bootstrap 4 and JavaScript and JQuery libraries of bootstrap. The final product of computing client's focuses was done precisely.

Anyway we could have executed some minor changes that would prompt better execution of this task. Basically we have effectively achieved the significant goals presented by this task.

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