Group Members : Jay Seung Yeon Lee, Derek Chang

CPSC 1160 Project Proposal

Project name: NBA_Agent

Target : GMs of the team, Scouts, Players, and fans.

About Our program

This program allows the user to evaluate players based on awards / stats they earned over their career. We use our own algorithm to calculate what players are worth on our scale. Premium version of the program offers trade simulator which targets some of the fans, but mostly GMs, scouts, and players that are in the league.

Algorithm for player worth calculation:

Player base worth (will be calculated at the end of our player worth calculation) :

It is hard to expect a rookie player who has been in the league for a few years to play well. However, most of these players are still in their rookie contract and for those who have been playing well despite their lack of experience, it is safe to say they have a lot of potential and therefore have a lot of trade value. Baseworth bonus will be adjusted as players age out of their prime as well.

Calculation will be as follows :

If player career year < 5 && accumulative player worth points > threshold,

Player base worth = accumulative player worth * 0.5

Else if player career year < 15

Player baseworth = career year * 15

Else

Player baseworth = career year * 12

Awards and Stats calculation

Stats:

All stats are from the previous year

Points per game : 2 points

Rebounds per game : 4 points

Assists per game : 4 points

Steals per game : 5 points

Blocks per game : 5 points

Shooting % : points * Field goal %

Awards:

All-NBA Team : 50 points

All-Nba Second Team : 30 points

All- Nba Third Team : 15 points

All-Nba Defensive Team : 50 points

All-Nba Defensive Second Team : 30 points

All-Nba Defensive Third Team: 15 points

All-Star Game MVP : 20 points

Rookie Of The Year : 30 points

Defensive Player of The Year : 50 points

Sixth Man of the Year : 30 points

Teammate of the Year : 20 points

Scoring Title: 40 points

Finals MVP : 150 points

MVP : 100 points

Marking scheme

Menu 1:	0.5
Creating ID	1
Login	1
Menu 2:	0.5
Premium Id	0.5
Team Selection / Players per team	0.5
Scout evaluation	3
Trade simulator	4
Rookie draft	2
RegularId	
StatsPlayer	2
Prioque list (list of players in ascending order regards to player worth)	2
Admin	
UserReport	1
Modifying user's account information	1

Main features :

Creating ID/ Login:

a. When a user creates an ID, the user's login information will be stored in class users, which includes their ID, password, and access level.
b. After successfully logging in to the user's account, you will be directed to the second menu.
c. Players will have different access levels.
  - Lowest access level will be RegularId, which will only have access to stats of each players, and list of players with highest points value.
  - Next will be premiumID, which will have access to all of the features that are available for the users
  - Highest access level will be admin, which can alter and modify user's account information

Team Selection:

a. After user is logged in to his/her account, they will be asked to choose one of the following 4 teams: Milwaukee Bucks, LA Lakers, Brooklyn Nets, Golden State Warriors. Players per team will be assigned randomly.

Scout Evaluation:

a. Using the player worth calculator algorithm shown on the first page of the proposal, Players are given points they are worth. We will read players stats and awards from the csv file we prepared and calculate each players worth.
b. Player's name and worth will be stored in a linked list.

Trade simulator:

a. Trade simulator includes players evaluation (taking stats and awards in consideration. Stats considered will be from season 2021 excluding play offs. Considering having a different stat multiplier) and picks (scales differently). We calculate the points according to the player stat + awards and match the points with the team that wants the trade

b. For comparing player value, we will use a template to compare them.

d. For a bonus mark, We can take salary of the players into consideration for the trading algorithm.

Rookie Draft:

a. Rookie Draft picks will vary per year. Not every year's rookies play as good as one another. We implemented our own algorithm to calculate each rookie's worth per each draft year.
b. Algorithm is shown below under Notable algorithm and notes under rookie draft section

Stats Player:

a. Stats Player will display all players with their stats and awards.
b. There will be two options for this part.
   a) Displaying players name and stats
   b) Displaying players name and awards

Prioque List:

a. Prioque List (Will be called PlayerRank) will get the linked listed players array and use bubble sort to sort them in ascending order by their worth.

User Report:

a. Only available when you are in the admin access level. You will be able to print the list of users that are registered in the program with their access level.
b. You can also save the list of users and their access level to a csv file

Modifying User Information:

a. Will be only available under admin access level. With admin access level, you will be able to modify user's ID, password and access level (Although real admin will never do such a thing).
b. Granting admin access level to a different ID is only available through this method. (Admin ID and Password will be hard coded)

Ex.

Admin ID = NBAadmin

Admin password = NBA123

Notable Algorithms and Notes

Creating ID:

- When you first enter the program, you will see a menu that will ask you if you want to log in, or create an account. This will look like the following:

Login Page:

Login Page will print:

Already have an account? Enter 1. If not, create an account with us! Enter 2 :

- Depending on the input, user will be redirected to the next menu page or creating ID page

Rookie Draft:

Generates draft class with random point values

Using recursion

Algorithm is as follows:

500+Math.random()%(1500-500+1)

firstroundPick * 0.7 + Math.random()%(firstroundPick-(firstroundPick*0.7));

Example for draft picks 2021 - 2028:

```
Public void draftPickInitialize(int value, int DraftYear, int pickCount){

//DraftYear being index of DraftYear ArrayList, DraftYear 2021 being index 0, year 2028
being index 7. Int value is the maximum value a pick can have. First round first pick start
at 1500. Pick count is the current number of picks, 1 being first round first pick, 60
second round 30th pick.

        if(pickCount >= 59){

                Value = (value * 0.7 ) + Math.random()%(value - (value*0.7));

                DraftYearArray.getYear().setpick(pickCount,value);

        }else{

                pickCount++;

                Value = (value * 0.7 ) + Math.random()%(value - (value*0.7));

                DraftYearArray.getYear().setpick(pickCount,value);

                draftPickInitialize(value,DraftYear,pickCount);

        }

}
```

Login Page:

```
        Login - Loop through user class dynamic array and if

        userList.get(i).get(id) == inputId && userList.get(i).get(pw) == inputPw
```