OBJECT-ORIENTED PROGRAMMING – CSC8406
COURSEWORK 2022-23
PROJECT REPORT

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AIM:

To print an "English Premier League" table consisting of a fixed number of clubs. Throughout a season of the league, each club plays another club and the result is recorded. Each club is awarded points for each match depending on the result, e.g., in football, you get three points for winning, one for drawing and none for losing. At the end of the season, the club with the most points wins the league. If two clubs have the same number of points, they are ranked by goal difference, which is the total number of goals they have scored minus the total number of goals they have conceded.

Each club (e.g. Newcastle United) has a squad of players, the size of which may vary from club to club. For each match that the club plays a team is selected from the squad. The team is always of a fixed size in football.

Each player (e.g. Leon Best) has a date of birth and a height and plays for one club. At the end of a league season, the player who has scored the most goals (i.e. has the largest goal tally) wins the Golden Boot trophy.

REASONING:

There are five classes and one driver class (main method) to run the program, each class will be having different Fields, Constructors, Methods and functions to run the program.

1. Player class:

    The Player class represent the player and manages the player in the league, club and match, A player plays for a club in a match that can be of a league.

    Fields of the player class have the variables of the player's name, height, date of birth, age and goal tally of the player.

    In the constructor parameters of player name, height and date of birth are passed.

    By creating different set and get methods, to retrieve the name, height, date of birth and goal tally of the player in the league.

Figure 1 shows the class diagram of the Player class.

Figure 1

2. Club class:

   Club class represents the club in the league.

   Fields of the club class have the variables of the club name, the number of players in the club, the size of the club, the total goals scored and conceded by the club and the points tally of the club.

   In the constructor, the parameter of the club name is passed and initializing the values of different variables in the club class.

   By creating different methods to provide the average age of the club, the height of the club, the points tally of the club, the goal difference of the club, the goal-scored tally of the club and the goal-conceded tally of the club.

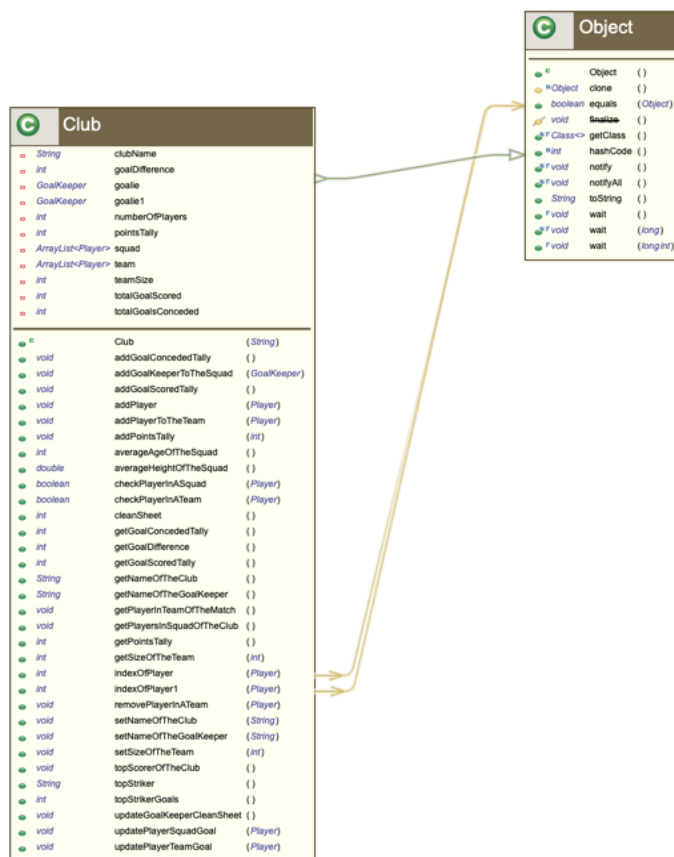   Figure 2 shows the class diagram of the Club class

Figure 2

3. Match class:

   It represents the matches played in the league and also it manages the matches between the clubs.

   Fields of the match class have the variables of the match venue, match time details of the playing club and final scores and results of the clubs.

   In the constructor, the parameter of venue, time and clubs playing in the match details are passed.

   By creating different set and get methods we can set the values of time, venue, final scores and the result of the matches

   Figure 3 shows the class diagram of the Match class

Object

	Object	( )
Object	clone	( ) CloneNotSupportedException
boolean	equals	(Object obj)
void	finalize	( ) Throwable
Class<>	getClass	( )
int	hashCode	( )
void	notify	( )
void	notifyAll	( )
String	toString	( )
void	wait	( ) InterruptedException
void	wait	(long timeoutMillis) InterruptedException
void	wait	(long timeoutMillis, int nanos) InterruptedException

Match

ArrayList<Player>	PlayersScoring	
Club	PlayingClub1	
Club	PlayingClub2	
int	clubOneScore	
int	clubTwoScore	
int	hrs	
League	league	
LocalTime	matchTime	
String	matchVenue	
int	min	
String	result	
boolean	status	

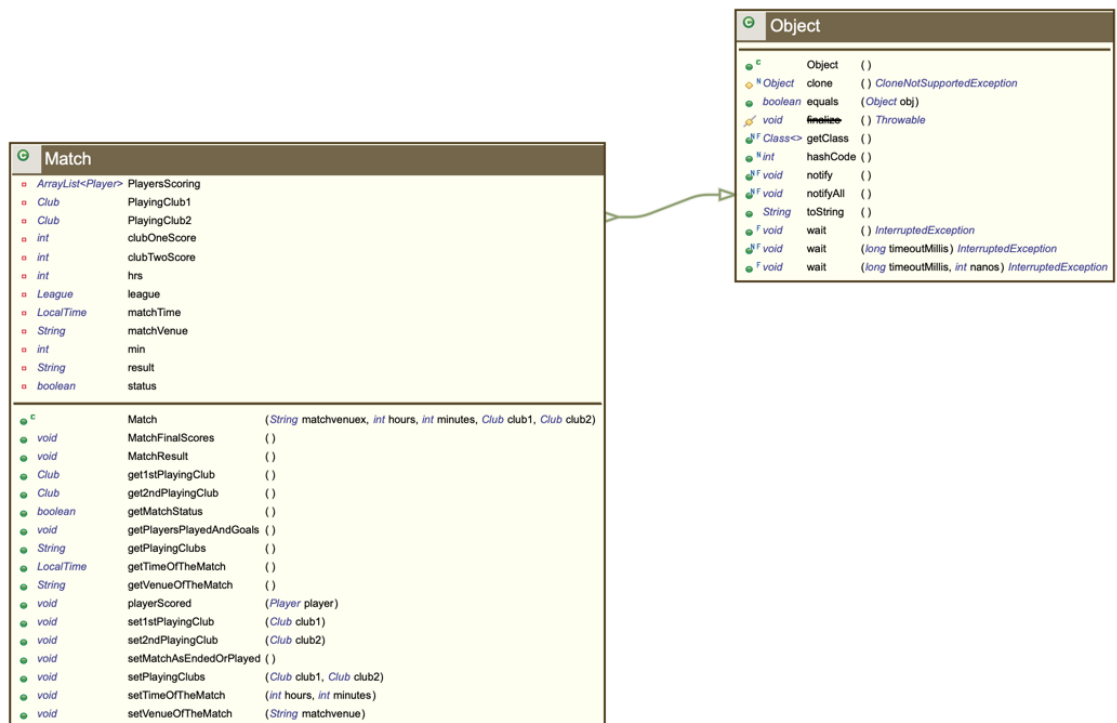|		
	Match	(String matchvenuex, int hours, int minutes, Club club1, Club club2)
void	MatchFinalScores	( )
void	MatchResult	( )
Club	get1stPlayingClub	( )
Club	get2ndPlayingClub	( )
boolean	getMatchStatus	( )
void	getPlayersPlayedAndGoals	( )
String	getPlayingClubs	( )
LocalTime	getTimeOfTheMatch	( )
String	getVenueOfTheMatch	( )
void	playerScored	(Player player)
void	set1stPlayingClub	(Club club1)
void	set2ndPlayingClub	(Club club2)
void	setMatchAsEndedOrPlayed	( )
void	setPlayingClubs	(Club club1, Club club2)
void	setTimeOfTheMatch	(int hours, int minutes)
void	setVenueOfTheMatch	(String matchvenue)

Figure 3

4. League Class:

League class manages the clubs and players

Fields of the league consist of variable Club Array List, Match Array List, league name and club limit

In the constructor, the parameter of the name and club limit is passed.

By creating different get and set methods we can get the name of the league and get the results of the league.

Figure 4 shows the class diagram of the League class
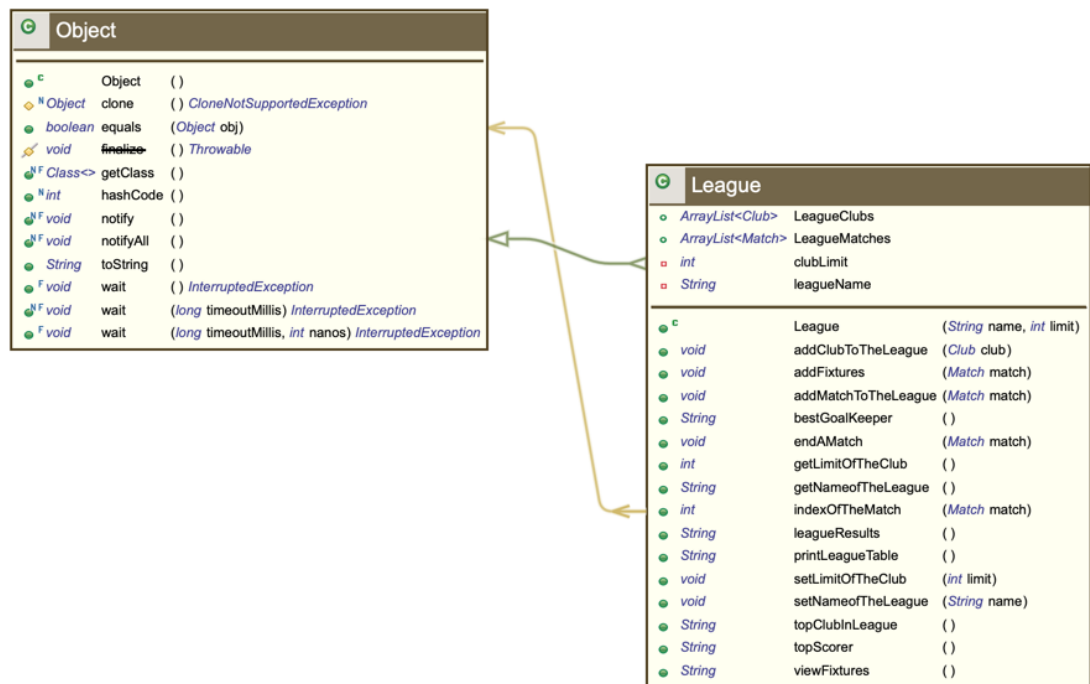
Figure 4

5. Driver class:

    Driver class is the main class of the league project

    It revokes all the methods from the Player, Club, Match, League and Goalkeeper classes and prints the required output by creating the file and object of each method and writing the output to the file path also in the print screen window of the Eclipse.

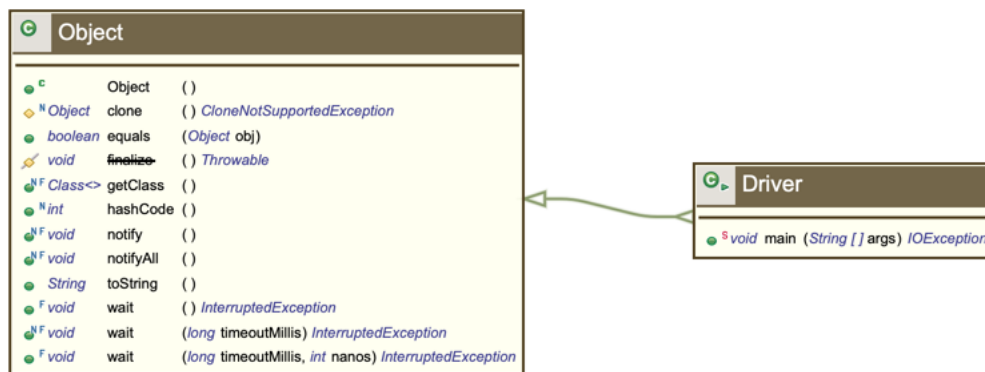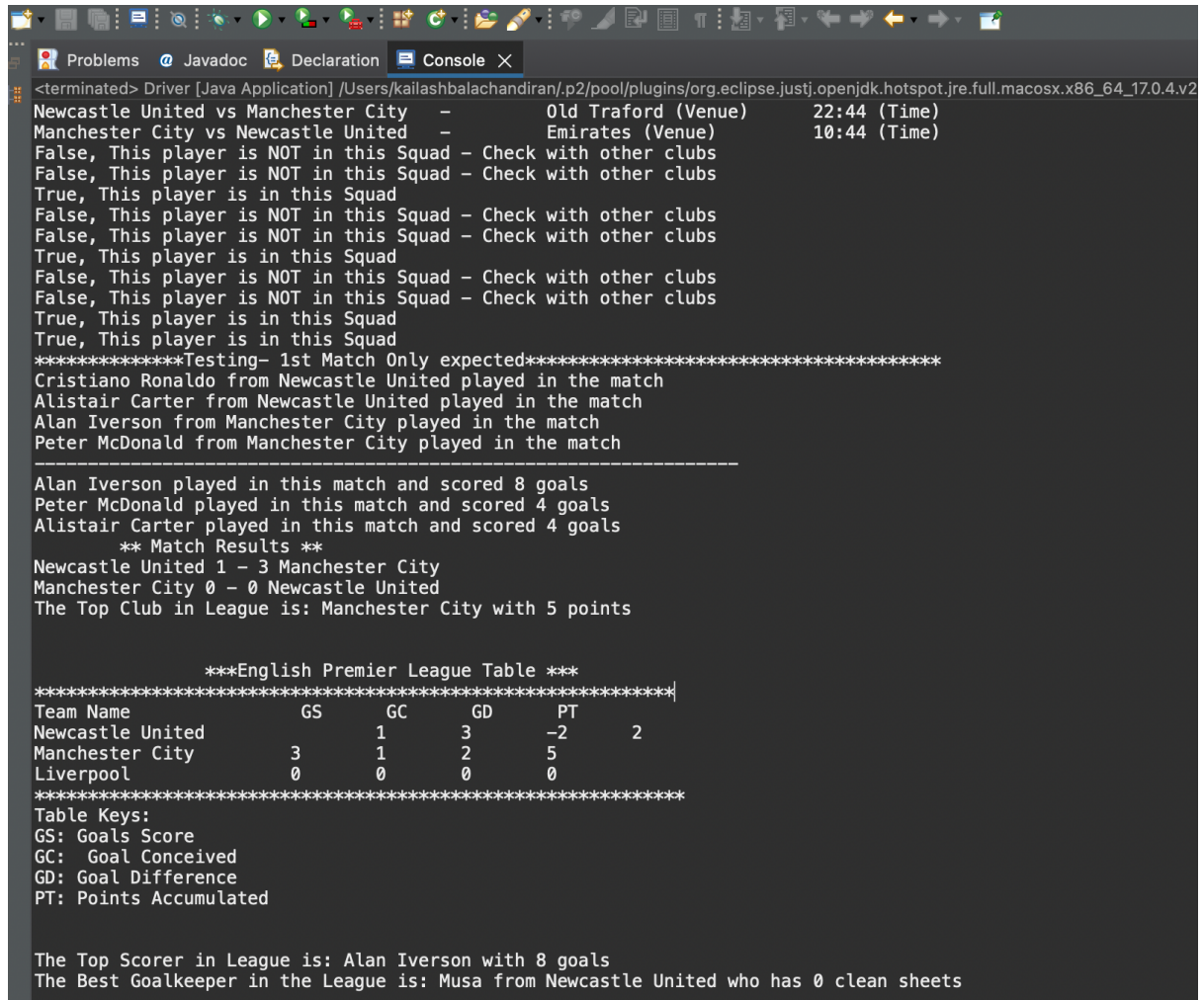   Figure 5 shows the class diagram of the driver class

Figure 5

OUTPUT AND IMPLEMENTATION:

The output of the program shows the fixtures (matches not yet played) of the league, checks whether the player is in the squad or not bypasses the player value into the league matches, it prints "True" if the player exists in the squad and "False if the player was not in the squad, shows which player played for which club and prints the name of the player and club saying e.g., "Cristiano Ronaldo" from Newcastle United played in the match., also shows the number goals played by the players and prints the match results of the club, prints the top club in the league with the points, finally it prints the league table with the values of GS (Goal scored), GC (Goals conceded), GD (Goal Difference), PT (Points), At last, it prints the top scorer of the league and the best goalkeeper in the league as shown in the output in Figure 6.

Figure 6 shows the output after passing the constant parameters to the program.


```
Problems  @ Javadoc  Declaration  Console  ✕
<terminated> Driver [Java Application] /Users/kailashbalachandiran/.p2/pool/plugins/org.eclipse.justj.openjdk.hotspot.jre.full.macosx.x86_64_17.0.4.v2
Newcastle United vs Manchester City    –        Old Traford (Venue)      22:44 (Time)
Manchester City vs Newcastle United    –        Emirates (Venue)         10:44 (Time)
False, This player is NOT in this Squad – Check with other clubs
False, This player is NOT in this Squad – Check with other clubs
True, This player is in this Squad
False, This player is NOT in this Squad – Check with other clubs
False, This player is NOT in this Squad – Check with other clubs
True, This player is in this Squad
False, This player is NOT in this Squad – Check with other clubs
False, This player is NOT in this Squad – Check with other clubs
True, This player is in this Squad
True, This player is in this Squad
**************Testing– 1st Match Only expected****************************************
Cristiano Ronaldo from Newcastle United played in the match
Alistair Carter from Newcastle United played in the match
Alan Iverson from Manchester City played in the match
Peter McDonald from Manchester City played in the match
---------------------------------------------------------------------
Alan Iverson played in this match and scored 8 goals
Peter McDonald played in this match and scored 4 goals
Alistair Carter played in this match and scored 4 goals
        ** Match Results **
Newcastle United 1 – 3 Manchester City
Manchester City 0 – 0 Newcastle United
The Top Club in League is: Manchester City with 5 points


                ***English Premier League Table ***
*****************************************************************
Team Name              GS     GC     GD      PT
Newcastle United              1      3      -2      2
Manchester City        3      1      2       5
Liverpool              0      0      0       0
*****************************************************************
Table Keys:
GS: Goals Score
GC:  Goal Conceived
GD: Goal Difference
PT: Points Accumulated


The Top Scorer in League is: Alan Iverson with 8 goals
The Best Goalkeeper in the League is: Musa from Newcastle United who has 0 clean sheets
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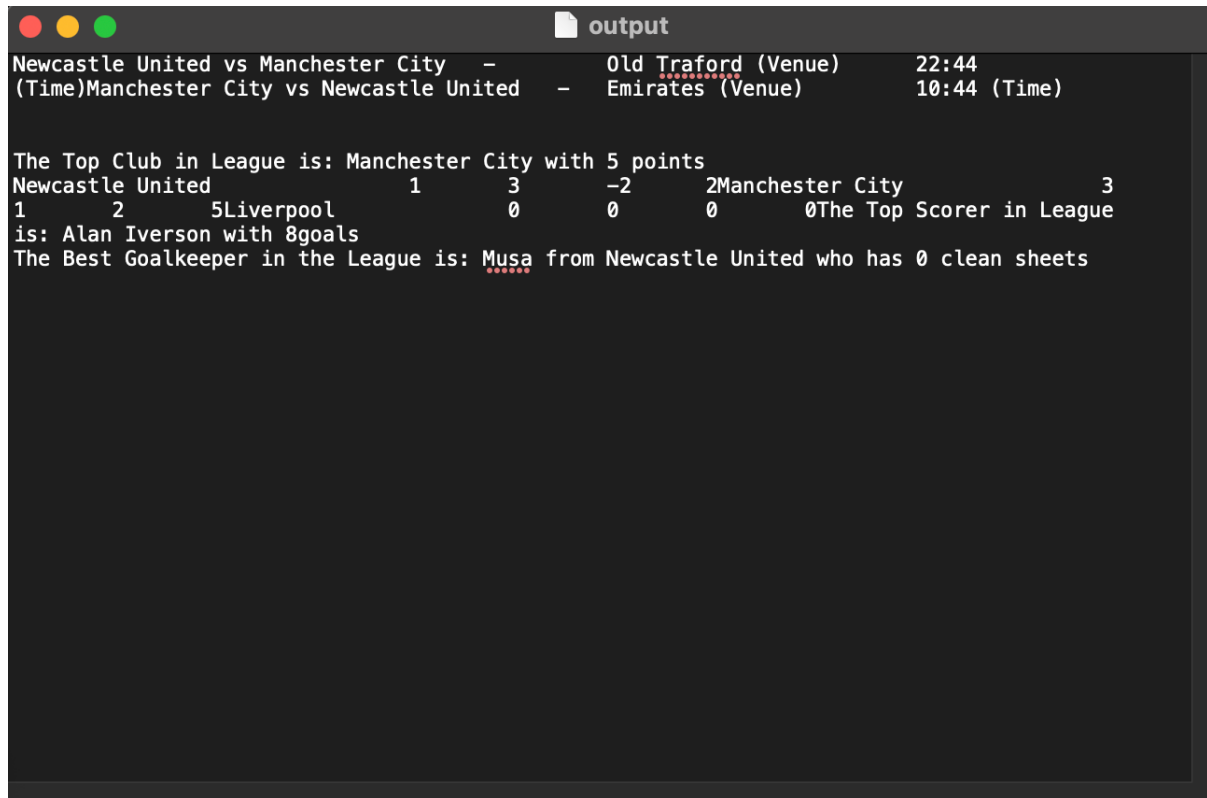
Figure 6

Figure 7 shows the output writing in the file

Figure 7

INSTRUCTION TO RUN THE PROGRAM:

The program should be run on the main method (Driver class) of the Eclipse tool.