Hacettepe University
Computer Science and Engineering Department

Name and Surname	**:** Necati Berk ÖZGÜR
Identity Number	**:** 21785229
Course	**:** BBM203
Experiment	**:** Programming Assignment III
Subject	**:** Usage of Linked Lists
Date Due	**:** 16/12/2018
Advisors	**:** R. A. Merve Özdeş
e-mail	**:** b21785229@cs.hacettepe.edu.tr

IMPORTANT WARNING: THIS PROGRAM SHOULD BE COMPILED WİTH "-std=c++11" FLAG. (A makefile is also attached)

2. Software Using Documentation

2.1. Software Usage

To run this software properly, user should provide 2 input files: one with players and their info(matches, goals, etc.), one with commands. Program processes these input files and prompts proper outputs regarding the commands given.

2.2. Provided Possibilities

-Program can provide the information of most scored half and top player statistics.
-Program can print the names of players who scored hat-trick.
-Program can print the team names in league.
-Program can print the player names in league.
-Program can print the matches of given footballer in ascending/descending order.

2.3 Error Messages

Program gives an error when:

-An invalid file has given as input or no file has given.

3.Software Design Notes

3.1. Description of the program

3.1.1. Problem

A system should be designed to observe the league statistics.

3.1.2.Solution

The ideal solution for this problem is storing necessary information as data, which means ready to use, classified packages of information. But it is hard to maintain and inefficient when developer has many data to store. So, we can store this given data as a **linked list**, to achieve effectiveness since it is easy to manipulate. Also linked lists provides us a very smart algorithmic tricks. While we store given data in linked lists, we can store it in an order either ascending or descending, to reach the data required easily.

3.2. System Chart

INPUT	**PROGRAMS**	**OUTPUT**
Defined and given by user.	*assignment3.cpp*	*Output is written on output file.*

3.3. Main Data Structures

“Linked list” is the key data structure of this experiment. Besides, **`vector`** for to prevent memory maluse and **`struct/class`** structures are also used to implement various data types(Nodes, linked lists.)

3.4. Algorithm

1. Make initialization:
   1.1. Open input file(s).
        With built in C++ facility **`fstream`**.
   1.2 Generate proper assignments an classifications for players and their games.
        "**`players`**" linked list stores these player info and their matches.
2. Read commands.
   2.1 Write Most Scored Half, Top Scorer, Players who has Hat-Trick and list of teams.
   2.2 Read given commands from operations file and write proper outputs.

3. Print proper outputs to file given.

4. Close files and finish program.

3.5. Specaial Design Properties

In this design, "***`linked list`***" structure is mainly used to implement given informations as data.

4. Software Testing Notes

4.1 Bugs and Software Reliability

By the boundary checking, and auto-sizing required linked lists user is not going to face with such errors like "segmentation fault" caused by "invalid access".
But program is not protected against files with invalid commands(many lines, or less lines than needed.).

4.2 Software Extendibility and Upgradability

By modular construction(classes, structs etc.) of C++ language, the code is easily upgradable and reuseable.

REFERENCES

Pressman, 1987 (Supplied by ftp of Hacettepe University Dep. of Computer Science and Engineering)
The C Programming Language, Ritchie – Kernighan, 1988, Prentice Hall
Fundamentals of Data Structures in C++, Horowitz – Sahni, 2008, Silicon Press