



Date handed out: 7 May, 2018, Monday
Date submission due: 21 May, 2018, Monday, 23:55

Programming Assignment 4: Turkish Basketball League Score Board (BSL)

Purpose:

The main purpose of this programming assignment is to revise the topics that we have covered in CNG140 including fundamentals of C programming, conditional statements, repetitive statements, functions, arrays, pointers, dynamic memory allocation, files, strings, etc.

Description:

You will write a program to computerize the score board of the Turkish basketball league for a season and calculate certain statistics for a given team. During a season, a lot of statistics are kept about a basketball team. In this programming assignment, you will write a program that reads some statistics about a list of teams from a file and allows the user to process these statistics. Typically a lot of statistics are kept but in this assignment, you will use a simplified version.

As usual don't try to compile your entire program in one "big bang." Compile it piece by piece. Test each piece that you have compiled to make sure it works correctly before you add the next piece.

Programming Requirements

You will read the team records from a file which includes a table of records as follows:

Table 1 Score board - G: Total games, WH: Win home, LH: Lost home, WA: Win away, LA: Lost away

Team	G	WH	LH	WA	LA
Fenerbahce Dogus	25	12	0	10	3
Tofas	25	11	2	9	3
Anadolu Efe	26	13	1	6	6
Banvit	26	9	4	8	5
Darussafaka	26	11	2	4	9

From this table, you can compute the following additional values for these teams:

Total win = WH+WA

Total lost = LH+LA

Total Points = 2*totalWin + totalLost

Define a **structure** type to represent one row of this score board table. The structure will include a string to represent the name of the team, it will store the total games played (G), win home (WH), Lost home (LH), Win away (WA), Lost away (LA), total win (as calculated above), total lost (as calculated above) and total points (as calculated above). Write a program to implement the following steps to process such score board as follows.

- Load the table 1 from a file into an array of structures called scoreboard_table.
- Define and call the following functions.

Load_Scoreboard_Table -- Takes as parameters the name of the input file and the scoreboard_table array. Function opens the file, fills the scoreboard_table array, and closes the file. Then it returns the actual array size as the function result. Please note that you cannot make an assumption about the number of rows in the given table. When you

load the data from the file, you also need to compute the total win, total lost and also the total points.

Display_Scoreboard_Table – Takes the scoreboard_table array and its size as the parameter and displays the table on the screen. If the file has not been loaded (and thus the array is empty) then appropriate error message should be displayed to the user.

Search – Takes as parameters the scoreboard_table array, its actual size, and a string representing the name of the team. If the entered name is found then this function returns the position of this record in the array otherwise it returns -1 if that team is not found.

interactive_board – Takes as parameters the scoreboard_table array, its actual size, and depending on the input from the user reorders the records of the teams. The user can sort the data based on the total games played and total points.

A sample run will be as follows:

Score records file has been successfully loaded!
Following records have been loaded:

Team	G	WH	LH	WA	LA	Win	Lost	Points
Fenerbahce	25	12	0	10	3	22	3	47
Dogus								
Tofas	25	11	2	9	3	20	5	45
Anadolu Efe	26	13	1	6	6	19	7	45
Banvit	26	9	4	8	5	17	9	43
Darussafaka	26	11	2	4	9	15	11	41

Enter the name of the team (Exit - X, Sort - S): Utah Jazz

That team is unknown! Please try again!

Enter the name of the team (Exit - X, Sort - S): Fenerbahce Dogus

Fenerbahce Dogus has 22 win, 3 lost and total of 47 points!

Enter the name of the team (Exit - X, Sort - S): S

Sort by (G: games, P: points): P

Team	G	WH	LH	WA	LA	Win	Lost	Points
Anadolu Efe	26	13	1	6	6	19	7	45
Banvit	26	9	4	8	5	17	9	43
Darussafaka	26	11	2	4	9	15	11	41
Fenerbahce	25	12	0	10	3	22	3	47
Dogus								
Tofas	25	11	2	9	3	20	5	45

Enter the name of the team (Exit - X, Sort - S): X

Bye!

Grading:

Your program will be graded as follows:

Grading Point	Mark (100)
Load_Scoreboard_Table function that reads the file and <u>dynamically</u> populates the data from the file to the array. You should not make any assumption about the size of the data.	40 points
Display_Scoreboard_Table function that takes the array of scoreboard data and displays it to the user with appropriate messages.	10 points
Search function that takes a string for searching and looks up for that string in the array.	20 points
Interactive_board function that sorts the data by the value given by the user	20 point
Main function that coordinates these functions and extra functions needed.	10 point

Rules:

Please make sure that you follow the restrictions for the assignment as follows.

- **Strictly obey the input output format. Do not print extra things.**
- **You can use libraries such as `string.h` or `ctype.h`.**
- **You are not allowed to use global variables.**
- **Add your name/surname and ID at the top of your code as comments and name your source file "CNG140-P4-name-surname.c"**
- **Upload only source file. Do not compress it (zip, rar, ...)**