There are 3 classes in the program. They are Gamer, Match, Tournament.

In the Gamer class surname, name, matches, won, lost and points are the attributes. The constructor of this class, take 5 arguments and initiate the attributes. All the attributes are private, and I have implemented public getter methods for each attribute. There is another method to print a gamer object.

The Match class contains p1\_surname, p1\_name, p2\_surname, p2\_name, rounds, p1\_points, p2\_points, duration as private attributes and public getter method for each attribute. There is another method to print a match object.

The tournament class contains array of gamer pointers, array of match pointers and counter variables for each array to store the next position. The constructor method will allocate memory for gamers and matches attributes. addGamer() method takes details of the gamer and create object of the Gamer. Then the object will be stored in the gamers array. displayGamers() method will be used to display the details of each gamer object in gamers array. addMatch() method takes details of the match and create object of Match. Then the object will be stored in the matchers array. . displayMatches() method will be used to display the details of each match object in matches array.

The printLeaderboard() method is used to display the leaderboard of the game. It will iterate through each gamer and sort the gamers array according to the number of matches the gamer has won. Sorting is done in descending order. After the sorting displayGamers() method will be called to display the details of the sorted gamers. The searchPlayer() method is used to display all of the matches played by gamer. The method takes surname as an argument and iterate through each of the match and only display the matches that were played by the given player. displayLongestMatches() method takes number of matches(K) as an argument and print the K number of longest matches. In this method initially the matches array will be sort according to the duration in descending order. After that first K number of elements in the matches array will be printed.

deleteLastPlayers() method is used to delete the M number of gamers who has the minimum points. Initially the gamers array will be sorted in descending order according to the points scored by each player. Then the last M number of elements will be set to “nullptr” and number of gamers attribute will be decreased by value M. The deleteLowestRoundMatches() method is used to delete the matches which has the lowest rounds. Initially the matches array is sorted in descending order according to the number of rounds. Then the number of lowest rounds is found by last element in the array. After that we set the elements of matches array to null start from the end.

Inside the main program initially object of Tournament is created. Then Gamers.txt file is read line by line and call the addGamer method in the tournament to add the gamers. Next, Matches.txt file is read line by line and call addMatch method to add the matches.

Finally I have implemented simple menu and user can select the option and the relevant function will be executed according to the user input.

I have only used array data structure throughout the entire program. Along with each array I have used counter variable to find the next position of the array. The reason for using array is, it is easy to access elements in the array by using indices. And also it is very easy to iterate through an array.