

TRIBHUVAN UNIVERSITY



INSTITUTE OF ENGINEERING PULCHOWK CAMPUS

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TOURNAMENT ORGANIZER

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ABSTRACT

Football is one of the most popular and well loved-sports in the world. It is more than a game; it is more than just 22 players running on the pitch. Football is driven by passion and emotions. For many, football is a way of life, it is a religion. So what makes football such a well-loved sport? The game itself is beautiful but there's more to what makes football a joy to watch. A friendly game of football is not as enjoyable and doesn't feel as special as a World Cup match or a UEFA Champions League match. A well-organized football tournament is definitely much more thrilling than a poorly run one. Good organization of tournaments adds so much value to the sport. It is the core of a complete football experience.

Football fans not only watch football but they also love playing the beautiful game. Running local football tournaments is a good way to enjoy the sport and also promote football at a local level. The main goal of our project is to assist the organization of such local events. A local tournament has no boundaries. Not all tournaments can be run in the same way. There is no fixed way to run every local tournament. 3,5,7,10,12,15! There can be any number of teams in a local tournament. League, Knockout or even a mix of the both! We might want to organize our tournament in the way we like, we might want to organize our tournament in the format we prefer. So we require a tournament organizer that covers every possibility, every single way a tournament can be held. Keeping all this in mind, we have created a well-functioning tournament organizer which offers countless customizations and pathways to run a tournament. With the help of C-programming, we have developed a program which smoothly runs a tournament forward and is also equipped with many additional features like stopwatch, editing results, organizing matches in the order we want, saving and loading of the tournament and much more. Also, a program that has been coded to cover each and every possibility of running a football tournament definitely won't have much problems simulating a real-life professional tournament. So, our C mini project 'Tournament Organizer' is a multipurpose program that can run local tournaments and also simulate professional tournaments with high efficiency.

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We would like to thank authors whose books were a great reference for the completion of this project.

1. Mr. E Balaguruswami – Programming in ANSI C
2. Mr. Ram Datta Bhatta and Mr. Babu Ram Dawadi – A Textbook of C Programming
3. Mr. Krishna Kandel – Learning C by Examples
4. Mr. Yashwant Kanetkar – Let us C

Lastly, we would like to thank different authors of the following online platforms which provided us assistance at various stages of developing our project.

- 1.<https://www.geeksforgeeks.org/>
- 2.<https://www.quora.com/>
- 3.<https://forums.codeblocks.org/>

Chapter One

INTRODUCTION

This mini-project is prepared by C-programming using the concept of file handling, array, structure and functions along with various control statements. It is concerned with management of football tournaments. It can develop match fixtures for different types of tournaments. It takes the match scores and develops a score table on the basis of which further rounds are designed until the winner is obtained. It saves the data of incomplete tournaments using the file handling concept. As an additional feature, it also shows the running time of the match on the screen to the viewers.

1.1. Background and problem statements:

Games and sports share an integral part in our life. Football is one of the most played and loved sports in the world. As an assignment was given to the students to prepare a project using C language with a motive of helping them utilise their theoretical knowledge about C programming in practical life, we have utilized this golden opportunity to develop a tournament manager. Working on this project on one hand has helped us to be a better enthusiast in programming and on the other hand it has led to the development of a computer program that can manage football tournaments on local level as well as simulate real life tournaments.

It is a part of the subject Computer Programming (CT-452), first year and first part of Civil Engineering course. It took us around three weeks to build the project. The project required knowledge of conditional statements, looping, arrays, structures and data file handling features of C programming language. We got great assistance from all the lecture classes that happened throughout the semester being held by our computer teacher Mr. Santosh Giri. Along with that, we consulted various books on C programming that quenched our thirst for knowledge in programming.

After gaining the useful concepts, we started the project on modular levels. Each of our team members shared equal load by working on different parts such as designing algorithms and flowchart, coding, formatting, testing and debugging the modules and documenting the project.

We would utilise our leisure time on working on our part of the project and discussing the problems together on weekends.

In the preliminary days, we worked on creating logic of the program, coding and testing and debugging. After that, we discussed the preparation algorithm, flowchart and documentation. This developed the sense of teamwork, leadership and paved a path of friendship among the group members.

1.2. Objectives:

1. To learn about different library functions included in different header files.
2. To learn about the user defined functions, structure, array and data files in c.
3. To be able to develop complex programs aimed at solving specific problems in practical field as per users' requirements.
4. To have certain knowledge about requirements to successfully conduct Local Football Tournament and try to fulfill those requirements by developing a program in C.
5. To work together as a team sharing different responsibilities.

1.3. Limitations:

1. The Program is created with minimum use of graphics which makes its interface less attractive to the user.
2. The program doesn't support organizing two tournaments simultaneously as organizing a new tournament will overwrite the existing tournament.
3. Some functions like gotoxy() and textcolor() are not defined in CodeBlocks compiler. So, there alternative user-defined functions are used which are not discussed in our course.
4. The program might not have 100% efficiency if we try to simulate professional tournaments.

Chapter Two:

PROBLEM ANALYSIS

2.1. Understanding the problem

We, the members of the group, held the meeting and decided to develop a tournament manager for the project. The first questions that arose were as follows:

- I. What is the major framework of the project?
- II. What features are we going to include?
- III. What concepts do we need to do this?

2.2. Input Requirements:

In order to gain the meaningful and expected output, a proper input source is required. There are major input requirements at various parts of the source code for the Tournament Manager. Since it is the users who need to deal with the inputs and get the outputs using the program, the source code has to be written in such a way that the user can easily understand the input requirements. The system can be started after the user presses any key.

(After that, the user comes across different input requirements given below)

1) Organize a Tournament Program

- a) New Tournament
 - i) Name of tournament
 - ii) Number of teams
 - iii) Format of tournament
 - #1. League only
 - #2. Knockout
 - #3. Round Robin and Knockout

- (i)Names of teams
 - (ii)Times team play with each other
 - (iii)Pressing Y to randomize
 - (iv)Goals scored by different teams.
 - (v)Change the number of goals if mistaken
- b)Load tournament

2) Set a match Timer

- i)Starting time in minutes
- ii)Starting time in seconds

2.3. Output Requirements

The Output Requirements of this program are very simple. Since our program is basically one which deals with processing of data, we convey the results after processing the entered data. For instance, when the user has selected the type of tournament and entered the team names, we generate the match fixtures depending upon the type of tournament and ask the results of each of the matches. We process the entered information and design various rounds until the winner is obtained. If a user enters incomplete data, we save it for future continuation of the tournament.

2.4. Processing Requirements

The data is processed according to the user's requirement. Depending upon the type of tournament chosen and the number of teams entered, the program runs specific algorithms to generate match fixtures. Then the program calculates the score table and determines the position of teams in the tournament. Then further rounds are carried on with or without knockout phases to obtain the winning team.

2.5. Technical Feasibility

In the context of feasibility, the coding required quite a lot of hard work and research due to the multidimensional aspects of the program. We took the help of many internet blogs to design the algorithms required in the program. Since the program deals with various types of tournaments, it turned out to be quite lengthy. As a positive aspect of the program, it has become quite user interactive and flexible.

In addition, the program can deal with almost every requirement which a user comes across while conducting a football tournament. It also demanded a great deal of knowledge in relation to organizing football tournaments.

Chapter Three:

REVIEW OF RELATED LITERATURES

This project is based on high level language i.e. c programming. We have widely used control statements, looping, functions, arrays, structures and data files available in C.

C programming language:

C is a general-purpose programming language that is extremely popular, simple, and flexible to use. It is a structured programming language that is machine-independent and extensively used to write various applications. Structured programming is a programming paradigm aimed at improving the clarity, quality, and development time of a computer program by making extensive use of the structured control flow. This language was developed by Dennis Ritchie at Bell laboratories in 1972.

Control Statement:

A control statement is a statement that controls the flow of the program according to the conditions and determines whether other statements will be executed or not. There are two types of control statements based on their function.

(A) Selective structure:

Selective structures are useful when we need to execute statements on the basis of conditions. The selective statements make the decision before changing the order of execution. Following statements are available in C for selective structure:

- i. if statement
- ii. switch statement

Simple if statement

Syntax:

```
if(test_expression)
{
    true statement-block;
}
```

if else statement

Syntax:

```
if(test_expression)
{
    true statement-block;
}
else
{
    false statement-block;
}
```

Else if ladder

Syntax:

```
if (condition 1)  
    statement 1;  
  
else if (condition 2)  
    statement 2;  
  
....  
  
else  
  
default    statement;
```

switch statement

This statement determines the flow of the program depending upon the value of an expression.

Syntax:

```
switch (expression)  
{  
    case constant1:  
        statement-block1;  
        break;  
        .....  
        .....  
    default:  
        default-block;  
}  
}
```

goto statement

This statement changes the flow of the program from one point to another without any condition.

Syntax:

goto label;

Looping (or iteration)

It is the repetition of a certain block of statements until a given condition is satisfied. In C, for loop, while loop and do... while loop are available for iteration. The working principle of these loops is nearly the same, however they differ in the syntax and the position of initialization, update and the body of the loop.

Syntax:

for (initialization expⁿ; test expⁿ; update expⁿ)

{

body of loop;

}

while loop

Syntax:

initialization expression;

while(test expression)

{

body of loop;

update expression;

}

do while loop

Syntax:

initialization expression;

do

{

body of loop;

update expression;

*}while(*test expression*);*

(B) Nested Loop

A loop within another loop is called a nested loop.

break statement:

The break statement is used to jump out of a loop. The break statement terminates the execution of the nearest enclosing loop. It passes control to the statement that follows the terminated loop. In a switch structure, a break statement causes the program to execute the next statement after the switch.

Function:

A function is a self-contained program segment or module that carries out some specific tasks.

Dividing a program into basic building blocks aka functions helps in the following ways:

- Encapsulation of program
- Easy testing and debugging
- Division of work load among various programmers
- Lesser chances of error
- Easy modification of program

Types of function:

→ Library functions

Library functions are built-in functions that are grouped together and placed in a common location called library where each function here performs a specific operation. Eg: scanf(), printf(), gets(), etc are the library functions included in the stdio.h header file.

→ User-defined functions

A user-defined function is a function provided by the user of a program or environment, in a context where the usual assumption is that functions are built into the program or environment. User-defined functions make it significantly easier to understand, maintain, design and debug the program.

A user-defined function may or may not have return value and parameters passed.

I) Function Declaration

A function is declared globally. During declaration, the return type of the function, name of function and the parameters to be passed into the function are specified.

Syntax:

return_type function_name(type1 arg1,type n arg n);

II) Function Definition

It is the main body of the function. It contains the code for the tasks the function is supposed to do. The processed value can be returned into the calling function using return statement.

return_type function_name(type1 arg1,type n arg n)

{

Body of the function

}

III) Function Call

The function call transfers the control of program from calling function to the called function.

function_name(arg1, arg n);

Or

Variable_name= function_name(arg1, arg n)

File Handling

Most of the programs require the feature of storage of the data for future after the program is executed. And this is possible through the data files in C. For future access, the data files can store the program's data and information permanently in the secondary storage device.

FILE pointer

While opening a file, we point to the specific file with a file pointer. It is declared using FILE statement as:

*FILE *file_pointer;*

Opening a file : The file must be opened before performing any input/output operation.

Syntax:

ptr_variable=fopen(file_name,mode_string);

File Operations

A file can be opened in various modes depending upon the operations we wish to perform. They include reading, writing and appending. Some useful modes are:

- ✓ w – open for writing
- ✓ wb – open for writing in binary mode
- ✓ r – open for reading
- ✓ rb – open for reading in binary mode
- ✓ a – open for append, data is added to the end of file

- ✓ ab – open for append in binary mode

Closing a file

After performing required operations in the file, we close it with the `fclose()` statement.

Syntax:

```
fclose(file_pointer);
```

IO Operations in the file

`fputc(character_variable,file_pointer)` and `fgetc(file_pointer)` are used to write and read characters into and from the data file.

Similarly, `fputs(string_variable,file_pointer)` and `fgets(string_variable,value,file_pointer)` are used to write and read strings into and from the data file.

Formatted IO Operations in Data Files

`fprintf()` and `fscanf()` functions are used to write and read formatted data into and from the data files.

Syntax:

```
fprintf(file_pointer,"control_string",list_of_arguments);
```

```
fscanf(file_pointer,"control_string",&list_of_arguments);
```

Record IO operations in Data Files

In C, record IO operations can be carried out with the use of `fread()` and `fwrite()` functions to save or retrieve whole structures/arrays at once.

Syntax:

```
fwrite(&structure_variable,sizeof(structure),number_of_structure,file_pointer)
```

```
fread(&structure_variable,sizeof(structure),number_of_structure,file_pointer)
```

Chapter Four:

ALGORITHM DEVELOPMENT AND FLOWCHART

Algorithm for Main:

Step 1: Display “CUSTOM FOOTBALL TOURNAMENT”

Step 2: Call start function

Algorithm for start function:

Step 1: Declare integers format, n, a, t, string tnmt[50]

Step 2: Display the choices:

1. Organize the tournament
2. Use the stopwatch

Step 3: Read user’s choice

Step 4: For 2, call the timer function

For 1:

Display the choices:

- i. New Tournament
- ii. Load Tournament

Step 5: For ii goto load

For i:

Read the tournament’s name in tnmt and the number of teams in n

Step 6: Display the choices:

- a. League
- b. Knockout
- c. Round Robin and Knockout

Step 7: Read user's choice in format

Step 8: Write tnmt, n, format in 'tournament.txt'

load:

Step 9: Read tnmt, n, format from 'tournament.txt'

Step 10: For a, call roundrobin

For b, call knockout

For c, call hybrid

Algorithm for roundrobin function:

Step 1: Declare integer m, y, j, mid

Declare struct table variable s

Step 2: Loading a saved tournament:

Open the file 'round robin variables.txt'

Read the number of times the teams play with each other in m

Read leg marker in y

Read matchday no. in j

Read mid to know the no. of matches played in previous tournament

Close the file 'round robin variables.txt'

Step 3: Open the file 'table.txt'

Read the name of team, no. of matches played, points, goal scored, goal against, goal difference, name length, match checker and recent match goals in struct table variable s from the file 'table.txt'

Close the file 'table.txt'

Goto load

Step 4: To start a new tournament:

Read the number of times the teams play with each other in m

Set the match checker s[i].rcheck to 1

Read the names of teams in s[i].name and ask if the positions of teams need to be randomized

Save the data of s into the file ‘table.txt’

j=0, y=1

Ask to end the program

Step 5: Load:

l=y

leg:

Declare integer o

IF nmod2=0 THEN

o=(l*n)-l

ELSE

o=l*n

matchday:

Step 6 : Write s[i] into ‘table.txt’ where i=1 to n

IF lmod2=0 AND mid!=1 THEN

IF nmod2=0 THEN

swap s[i] and s[n-1-i]; i=0 to (n/2-1)

ELSE

swap s[i+1] and s[n-1-i]; i=0 to (n/2-1)

ENDIF

ENDIF

mid=0

Step 7: Display the matchday number j+1

Display the matches in the matchday as:

For even n:

s[i].name VS s[n-1-i].name where i=0 to (n/2-1)

For odd n:

s[i+1].name VS s[n-1-i].name where i=0 to (n/2-1)

Ask to end the program

if needed to end, write m, y, j, mid into round robin variables.txt

skippeda:

Step 8:

- For even no. of teams if s[i].rcheck=1:

Ask the score of the match s[i].name VS s[n-1-i].name with an option to skip the match for now

If not skipped, read the no. of goals scored by each team in s[i].g and s[n-1-i].g and set s[i].rcheck to 0 for i=0 to (n/2-1)

- For odd no. of teams if s[i+1].rcheck=1:

Ask the score of the match s[i+1].name VS s[n-1-i].name with an option to skip the match for now

If not skipped, read the no. of goals scored by each team in s[i+1].g and s[n-1-i].g and set s[i+1].rcheck to 0 for i=0 to (n/2-1)

Step 9: Display the skipped matches whose checker is 1

Step 10: Save the team data of s[i] into ‘table.txt’

Ask to end the program if opted to end, set y=1, mid=1 and save m, y, j, mid to ‘round robin variables.txt’

Step 11: Check the value of the checker rcheck

Goto skippeda if any matches are skipped

Step 12: Display the table of matchday 1

Ask if any data needs to be edited

Step 13: Save the matchday data (team names and scores) into ‘matches.txt’

Step 14: Calculate the team points as:

$$s[i].gs = s[i].gs + s[i].g$$

```

s[i].ga=s[i].ga+s[n-1-i].g
s[i].gd=s[i].gs-s[i].ga
IF s[i].g>s[n-1-i].g THEN s[i].pts+=3
IF s[i].g=s[n-1-i].g THEN s[i].pts+=1
    for i=0 to (n-1)

```

Step 15: Copy s[i] to another struct table variable t[i]

Step 16: Sort the teams of t[i] in descending order of their points

If the points are equal, check the goal difference

If goal difference is also equal, check the goals scored

Step 17: Save the sorted list of teams in ‘standings.txt’

Step 18: Display the sorted teams in a points table

The table has data under the headings:

Team, played, GS, GA, GD, Points

Step 19: To generate new match fixtures, change the order of teams as:

For even no. of teams:

```

temp=s[i]
s[i]=s[i+1]
s[i+1]=temp where i=0 to (n-3)

```

For odd no. of teams:

```

temp=s[i]
s[i]=s[i+1]
s[i+1]=temp where i=0 to (n-2)

```

Step 20: Set the checker s[i].rcheck to 1

Step 21: j++

IF j<o THEN goto matchday to start a new matchday

Step 22: l++

IF l<=m THEN goto leg to start a new leg

Step 23: Congratulate the winner (with highest points)

Display the cup

Algorithm for knockout function:

Step 1: Declare integers i,j,k,l,legs,final,a,b,p,r,edit,sread=-1,

lf,x,y,mid,end, and structures struct teams s[100],temp;

Step 2: if you are loading a saved tournament:

 Open knockoutvariables.txt file

 Load the values of legs,number of teams that receive bye,etc from the file to the variables like legs,b and other data respectively.

 Open knockout teams.txt file and load the data of the team to the structure team.

 If lf=1 then goto load1

 Else if lf=2 then goto load2;

Step 4: Open file match.txt

Step 5: Display How many times do the teams play each other?

Step 6: Read the value in legs variable

Step 7: Display How many times do they play each other in the final?

Step 8: Read in the final variable.

Step 9: Initialize the all s.check variable to 1.

Step 10: Read the names of teams in s.name

Step 11: Display Do you want to randomize?

If yes use rand() to randomize using for loop

Step 12: Calculate the number of teams that receive bye by using logic($b=2^x - n$) where $n < 2^x$ and x is a natural number.

Step 13: Initialize aggregate goal values to zero.

Step 14:

 Initialize y = 0

 Load1:

 Step 15: Open knockoutvariables.txt and knockout teams.txt

 Step 16: Display the teams that have received bye by using for($i=0;i<b;i++$)

- Step 17: If($n \leq 2$) then display final match
 elseif($n \leq 4$) then display semi final match
 elseif($n \leq 8$) then display quarter final match
 else display round 1
- Step 18: initialize $j = 1, i = b$
 Display team[i] vs team [n-j]
- Step 19: Write the details so far to files knockoutvariables.txt and knockout teams.txt
 Display Press e to end the program and any key to continue.
 If pressed e, write lf=1(Being first round) and values of all the variables like leg, final, etc to the file knockoutvariables.txt
- Step 20 : Run loop for($l=y; l < legs; l++$) to run round 1 for different values of legs
 a)If leg is even($l \% 2 == 0$) then swap the teams using temp
 skippedk1
 b) Display leg: $l+1$ and write to the file matches.txt.
 c) initialize $j = 1, i = b$ and run for loop
 d)Initialize all the $s[].check = 1$
 e) if($s[i].check == 1$) then display Match sn: $s[i].name$ VS $s[n-j].name$
 f) Display press s to skip the match for now and press any other key to continue.
 g)If not pressed s
 $s[i].check = 0$ and $s[n-j].check = 0$
 Read goals scored in $s[i].goals$ and $s[n-j].Goals$
 Add the goals to $s[].agg$
 if($l == legs - 1$) then compare aggregate goals and bring winning teams ahead
 in the array of structure using if ($s[i].agg < s[n-j].agg$)
 $temp = s[i]$
 $s[i] = s[n-j]$
 $s[n-j] = temp$

·elseif (s[i].agg< s[n-j].agg) then read the values of goals scored in penalties and use same logic of bringing winning teams ahead

If (l!=legs-1 and l%2!=0) then swap back the teams

Step 21: Close the loop

Step 22: Display remaining skipped matches for those where s.[]check=1

Step 23: Run for loop to enter for skipped matches and goto skipped1

Step 24: Initialize the check to 1 for next leg

editresultk1:

Step 25: Display teams and goals

Step 26: Display do you want to change goals of(y/Y) and if pressed y edit goals, aggregate and if l=leg-1 then check for the winning team using same logic as in step 20 g

Step 27: Goto editresultk1

Step 28: Display teams and goals.

Step 29: Store data to matches.txt

Step 30: Close loop for legs for round 1

Step 31: Display aggregate scores.

Step 32: if(n/2!=1)

1. Display The following teams have advanced to the next round:\n";
2. For (i=b;i<(n+b)/2;i++) and display s[i].name
3. Initialize n=b+j and y=0;
4. 1. Repeat from step 17 but start the loop from i=0 to i=n/2

5. Initialize $s[i].agg=0$ for each new round

Step 33: Close the if statement.

Step 34: Display Congratulations $s[0].name$, You have won the tnm

Algorithm for hybrid function:

Step 1: Declare variables h,i,j,k,l,m,p,tpg,ng,sum,min,z,adv,editg,edit, bye,power,legs,final,rem,ko,lf,mid,rc,sread=-1,y,x,end and file FILE*gt,*gv,*lt,*lv,*hv,*stand,*match,*group,*rlt; Structures general, group

Step 2: If nl=2

- load all the variables from the file hybrid variables.txt
- If rc=1 (First match) load different variable values from Group variables.txt, group teams.txt and goto load1
- Else if rc=2 load the values from latter stage teams.txt and goto load2 if lf =2
and load3 if lf=3

Step 4: rc=0, lf=1, mid=0, k=0, y=1, end=1

teamspergroup:

Step 5: Read tpg, m, legs and final

min=tpg-1

Step 6: If $n \bmod tpg=0$ then

ng=n/tpg

Initialize $a[].teams=tpg$ and goto input

else

ng=n/tpg+1

Step 7: Initialize i=0 and sum=0

loop:

Step 8: sum=sum+tpg

```
if sum<n then  
    a[i].teams=tpg  
    i++  
    goto loop  
else  
    a[i].teams=n-i*tpg  
end if
```

Step 9:

```
if(min-a[ng-1].teams>=(ng-1))
```

- Display Almost Even distribution of teams cannot be done with tpg teams per group. Please choose a different number.
- goto teamspergroup

Step 10:

- Display Enter the name of Team i+1 where i=0 to n
- Read the names in gen[i].name

Step 11:

- Display do you want to randomize?
- If pressed y, randomize the teams using rand()

Step 12:

```
for loop (a)(i=0;i<ng;i++)  
for loop (b)(j=0;j<a[i].teams;j++)  
    strcpy(a[i].grp[j].name,gen[z].name);  
    z++  
Goto for loop b  
Goto for loop a
```

Step 13: Initialize $a[j].grp[i].pts=0;$

```
a[j].grp[i].GS=0;  
a[j].grp[i].GA=0;  
a[j].grp[i].GD=0;  
a[j].grp[i].p=0;  
a[j].grp[i].len=strlen(a[j].grp[i].name);
```

Display How many teams from each group will advance to the next round?

Step 14:For loop(c) ($i=0;i<=6;i++$)

```
power=pow(2,i)  
if((adv*ng)<=power then break the loop  
Goto c
```

Step 15: rem=power-(adv*ng)

Step 16:

- Display Choose
- Display 1) adv*ng teams will qualify for the next round and some of the best placed teams will receive bye to the round after that.
- Display 2)rem next best placed teams out of ng groups will qualify for the next round along with the best adv teams of their groups and all the teams will take part in the 1st knockout round.

Step 17:Read the option to ko

Step 18:Initialize $a[].\text{check}$ to 1

Step 19:if(tpg%2!=0)

```
tpg=tpg+1;
```

Step 20:Open group teams.txt and hybrid variables.txt

Step 21:Use round robin algorithm from step 5 to 22.

Step 21:If $ko=2$

- Initialize $j=adv$
- Sort the teams in descending order of their points scored

- If the points scored are equal, sort them according to their goal differences.

Step 22: Display ranking of next best teams

Step 23: Display the teams that have advanced to the next round

Step 24: Initialize rc=1,y=0, x=0,mid=0,end=1

Step 25: if ko=2

```
n=adv*ng+rem
```

```
else
```

```
n=adv*ng
```

Step 26: Put all the best teams from each group in one structure and put all next best teams from each group in next structure and so on.

Step 27: Shuffle each structure.

Step 28: Copy all the teams to a single structure.

Step 29: Use the knockout algorithm from step 12 to 18.

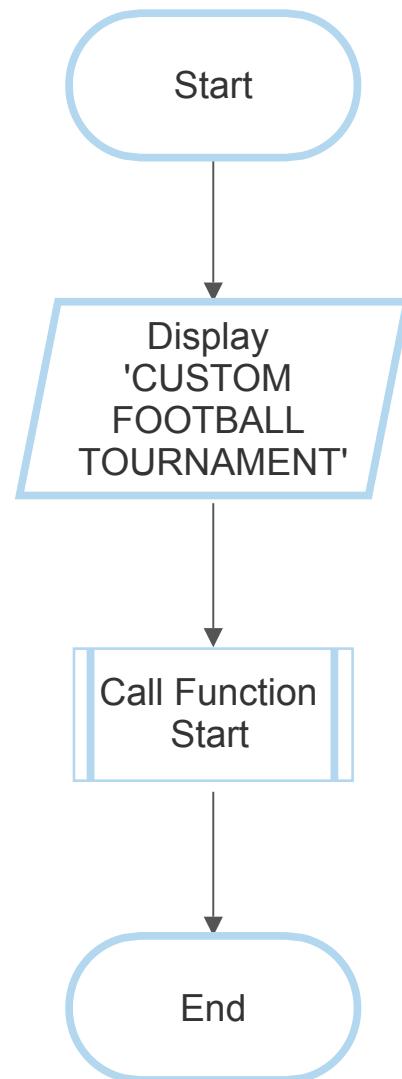
Step 30:

- Display do you want to redraw?
- If pressed y, goto step 27.

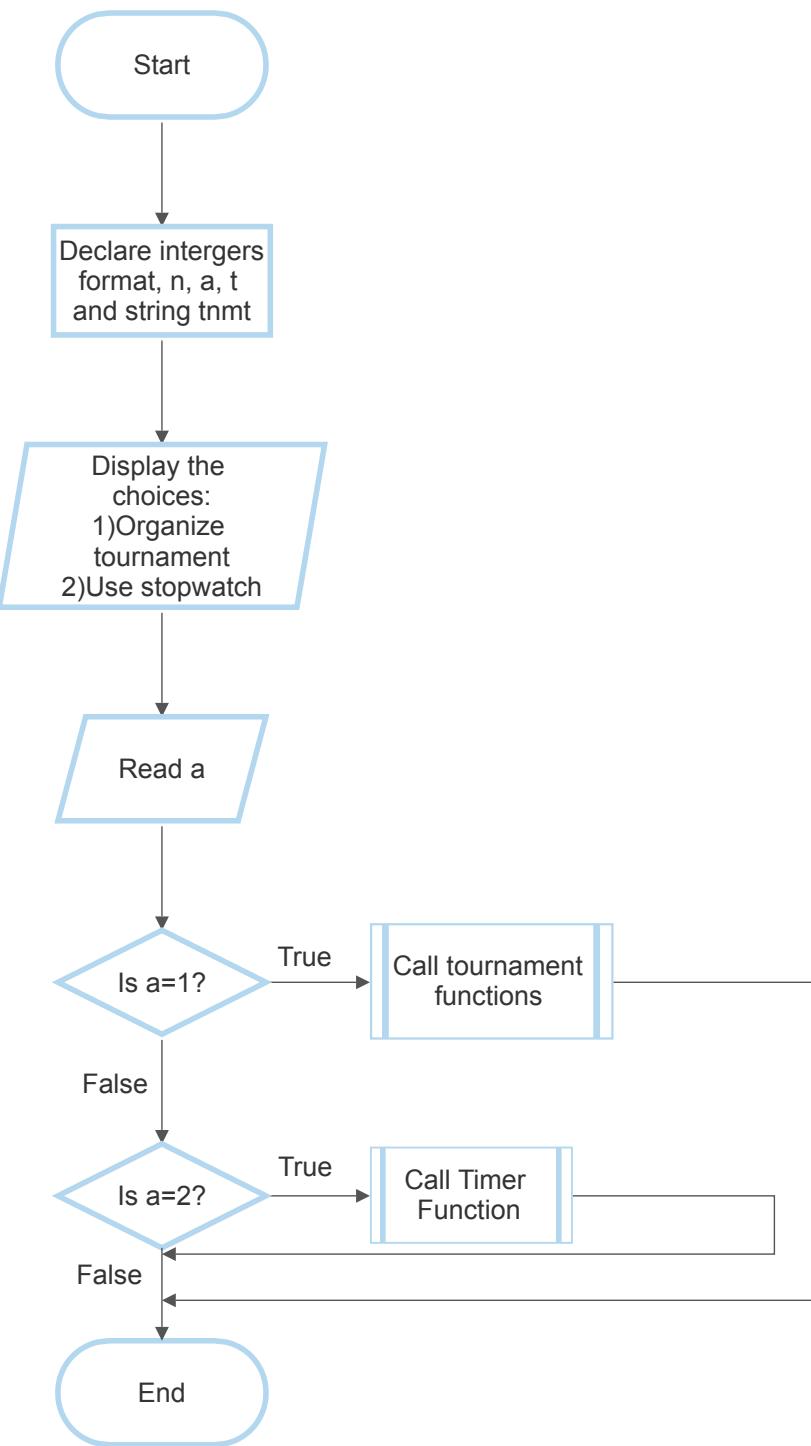
Step 31: Use the knockout algorithm from step 19 to 33.

Step 32: Display Congratulations gen[0].name, You have won the tnmt!

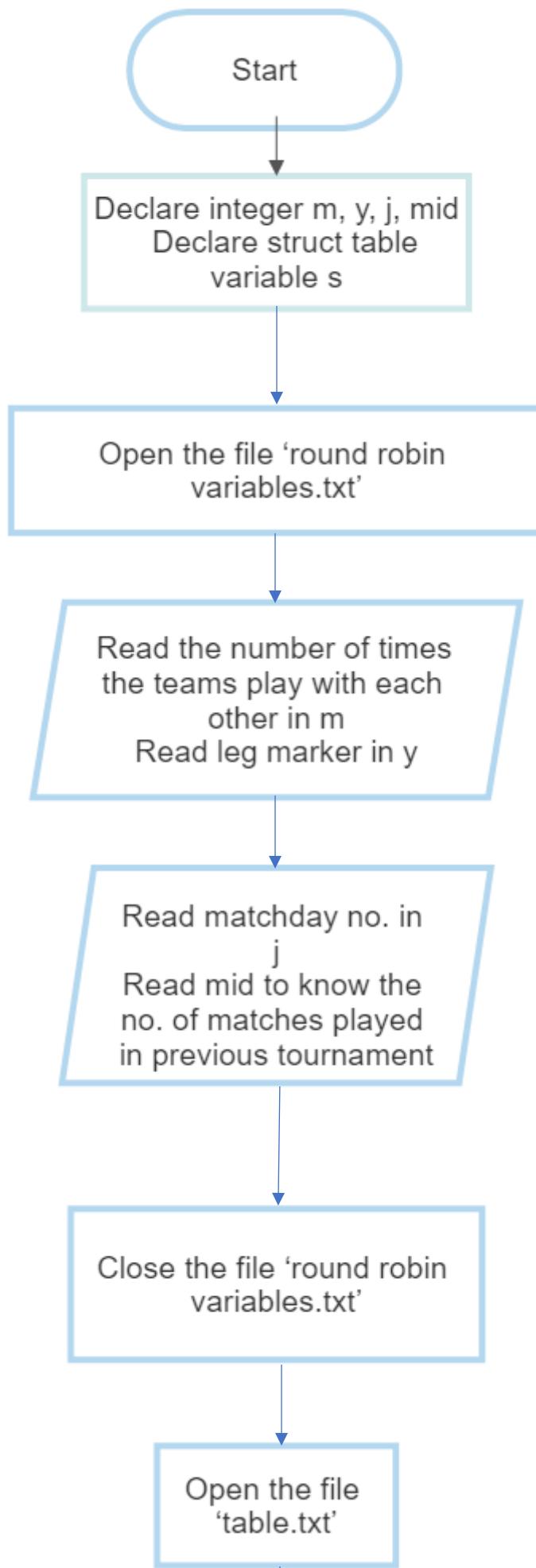
Flowchart for main function

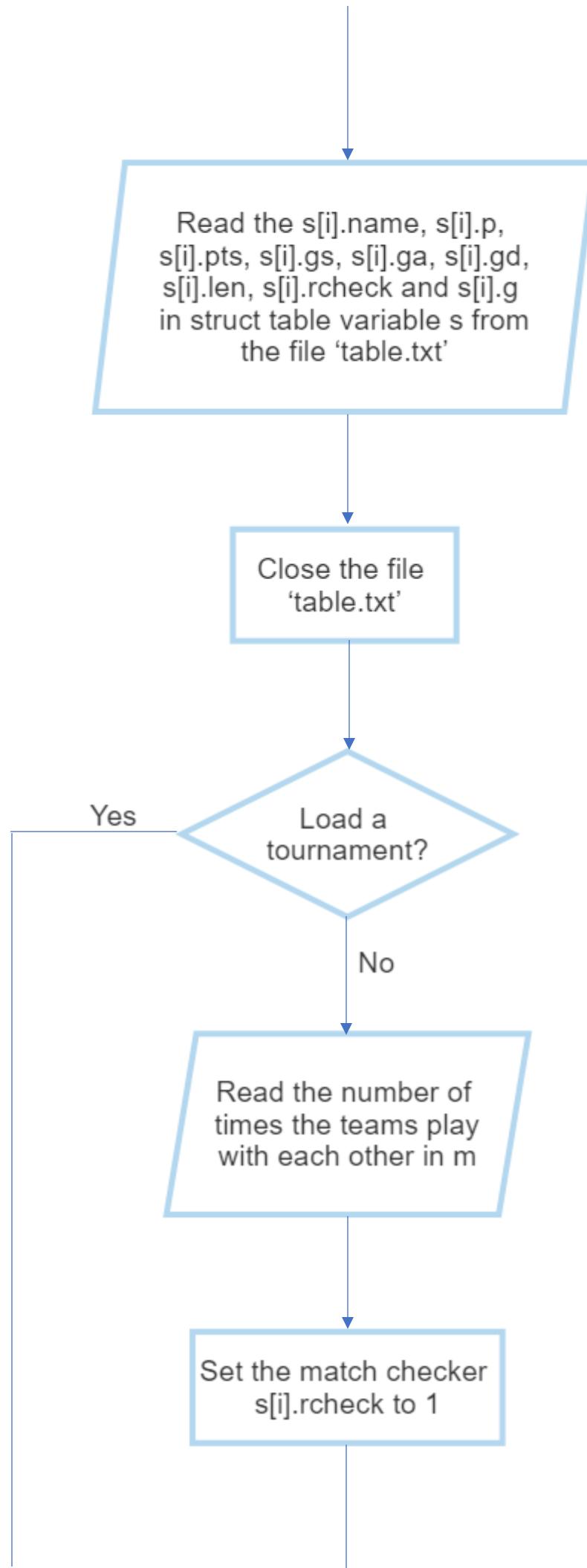


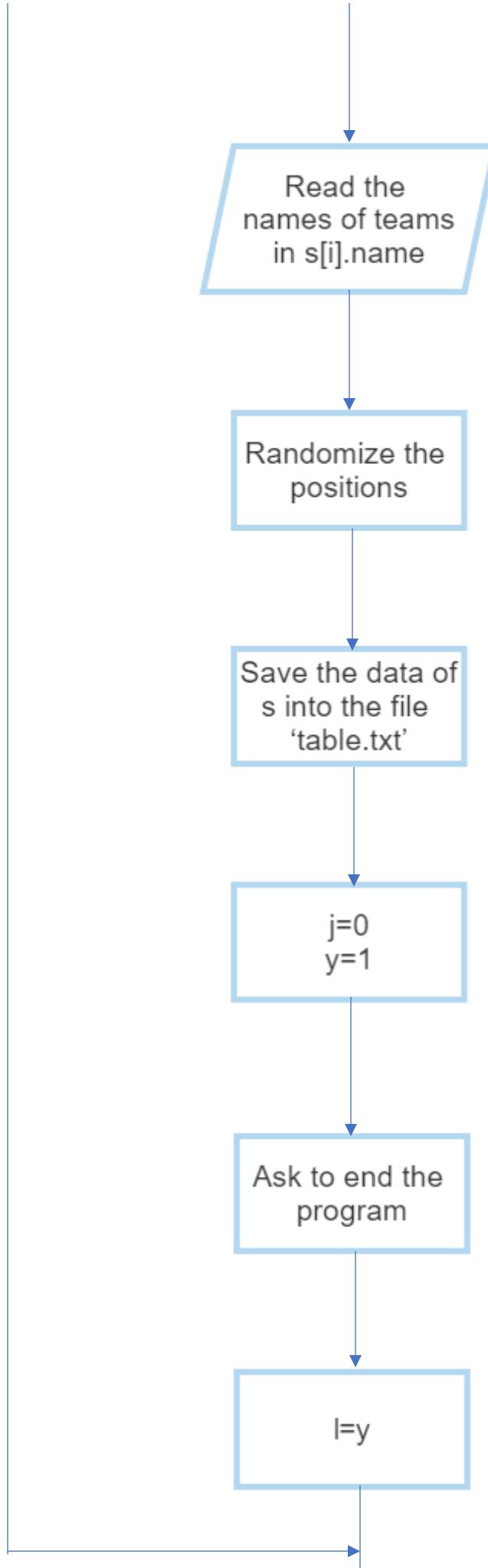
Flowchart for start function

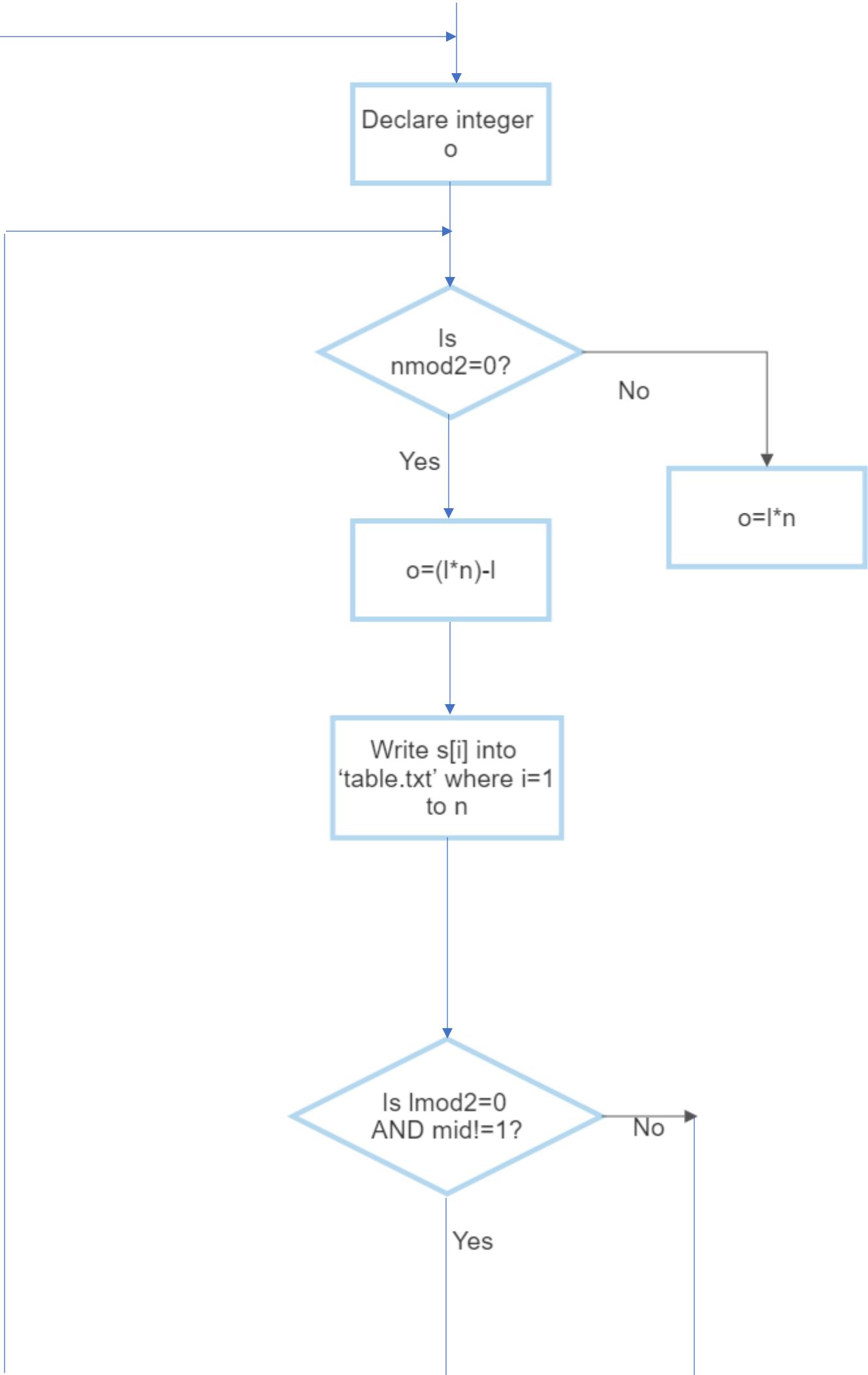


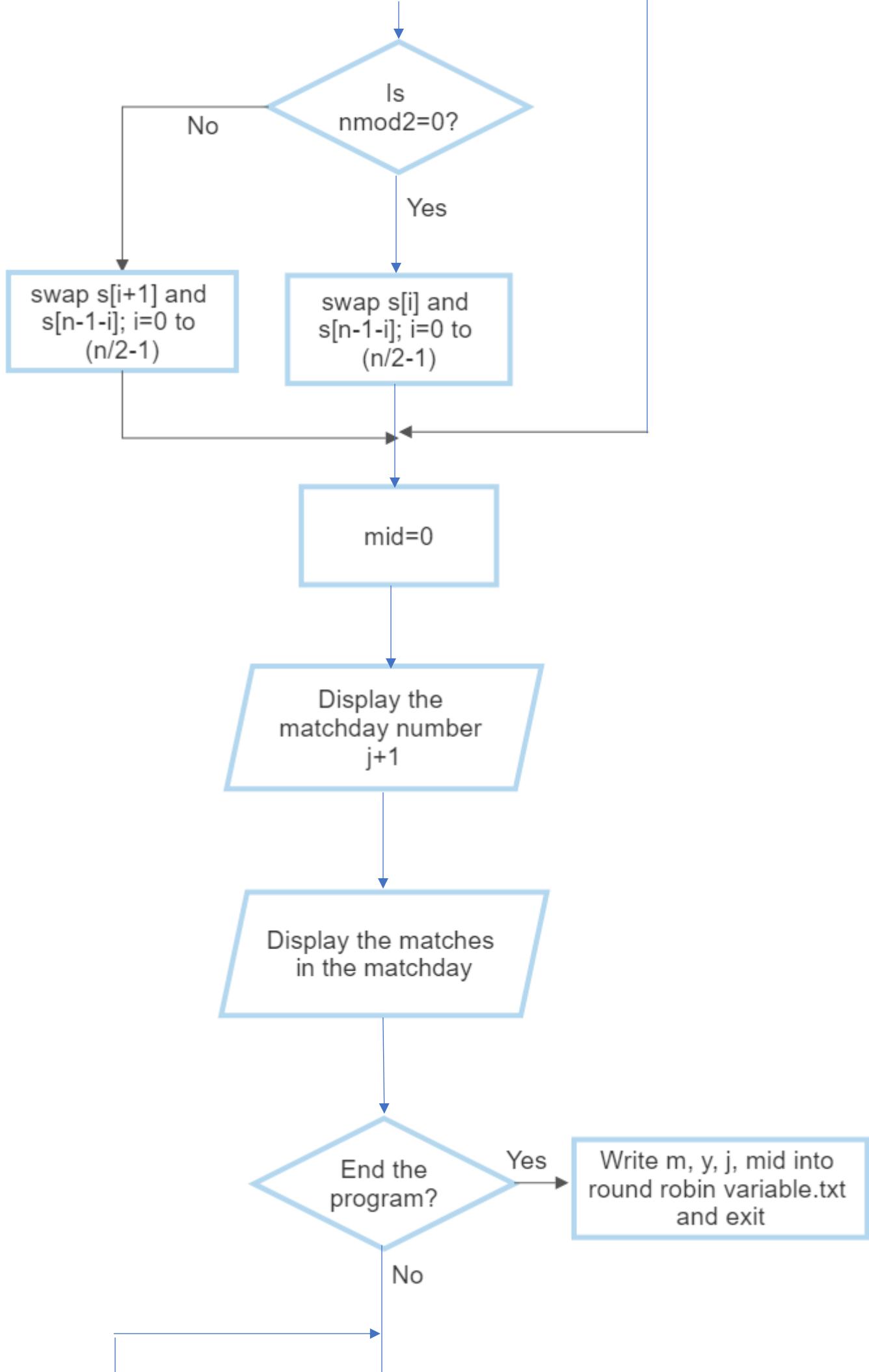
Flowchart for Round Robin

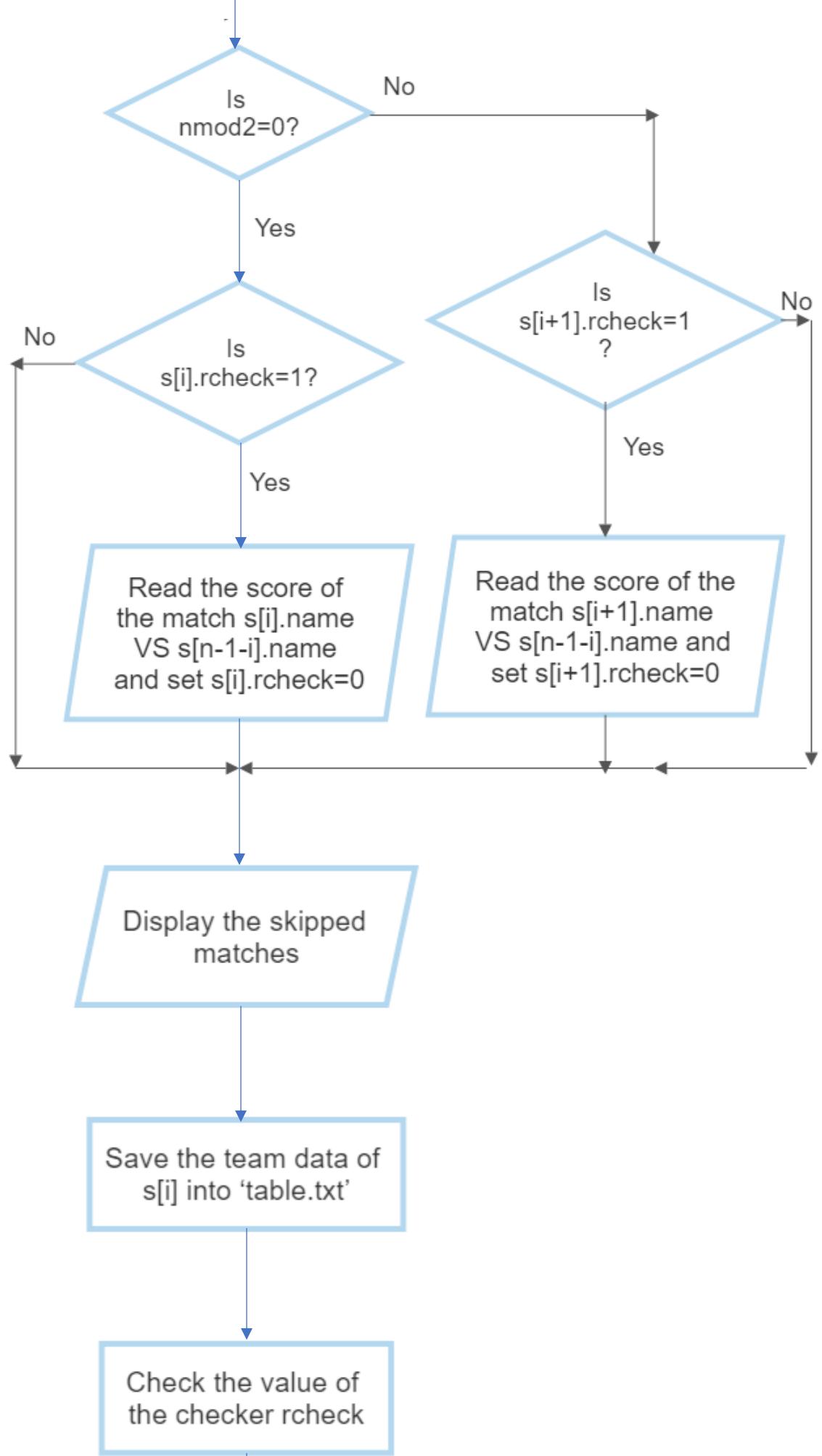


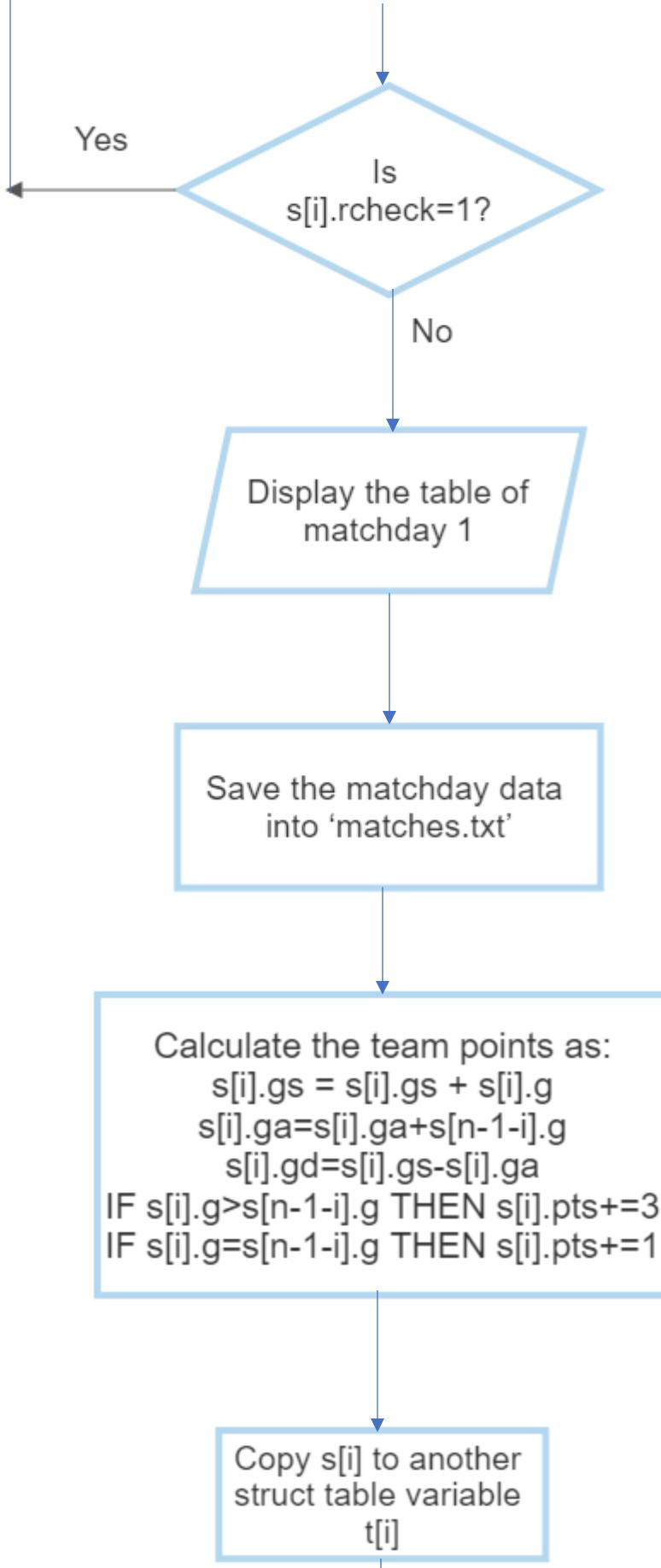












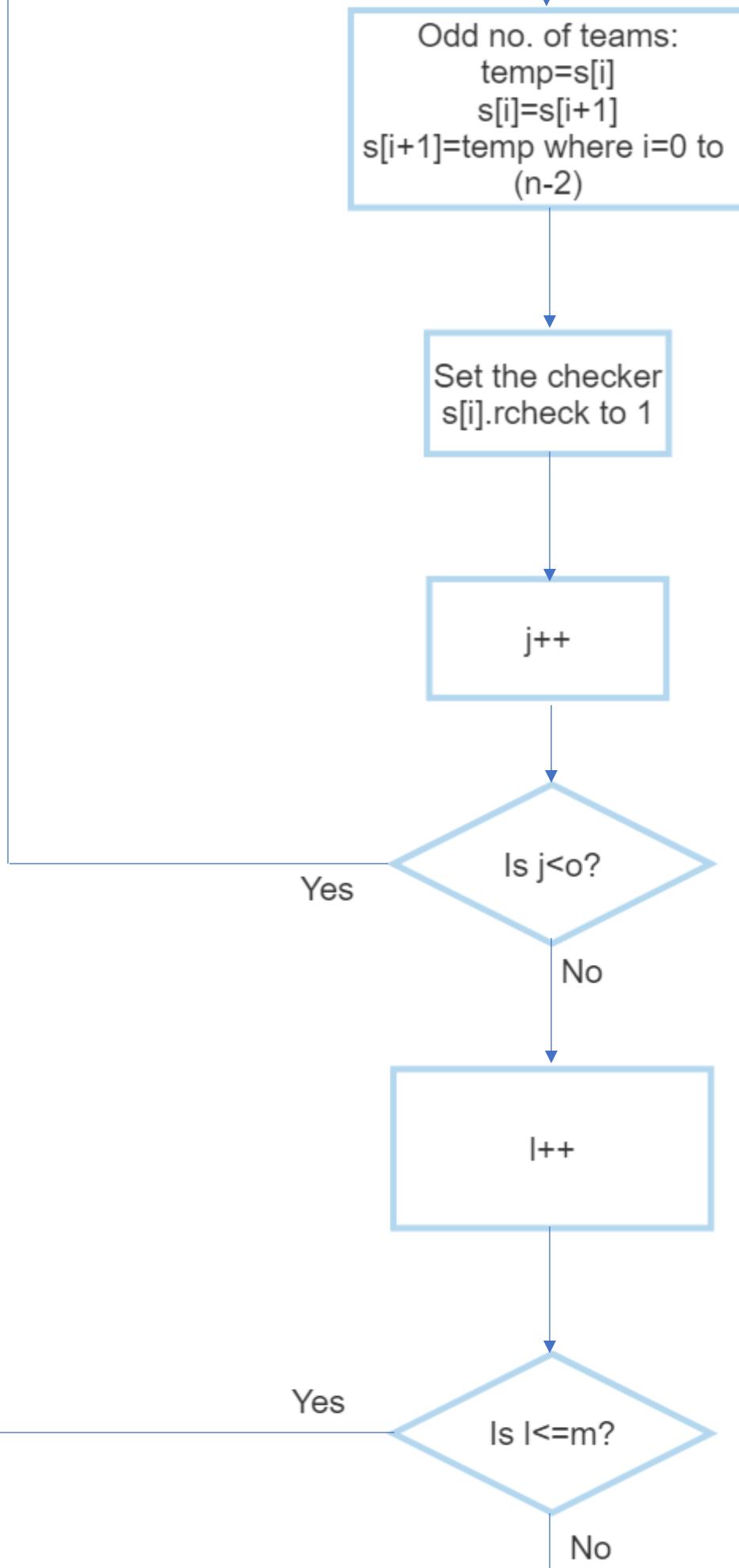
Sort the teams of $t[i]$ in descending order of their points

Save the sorted list of teams in 'standings.txt'

Display the sorted teams in a points table

To generate new match fixtures, change the order of teams

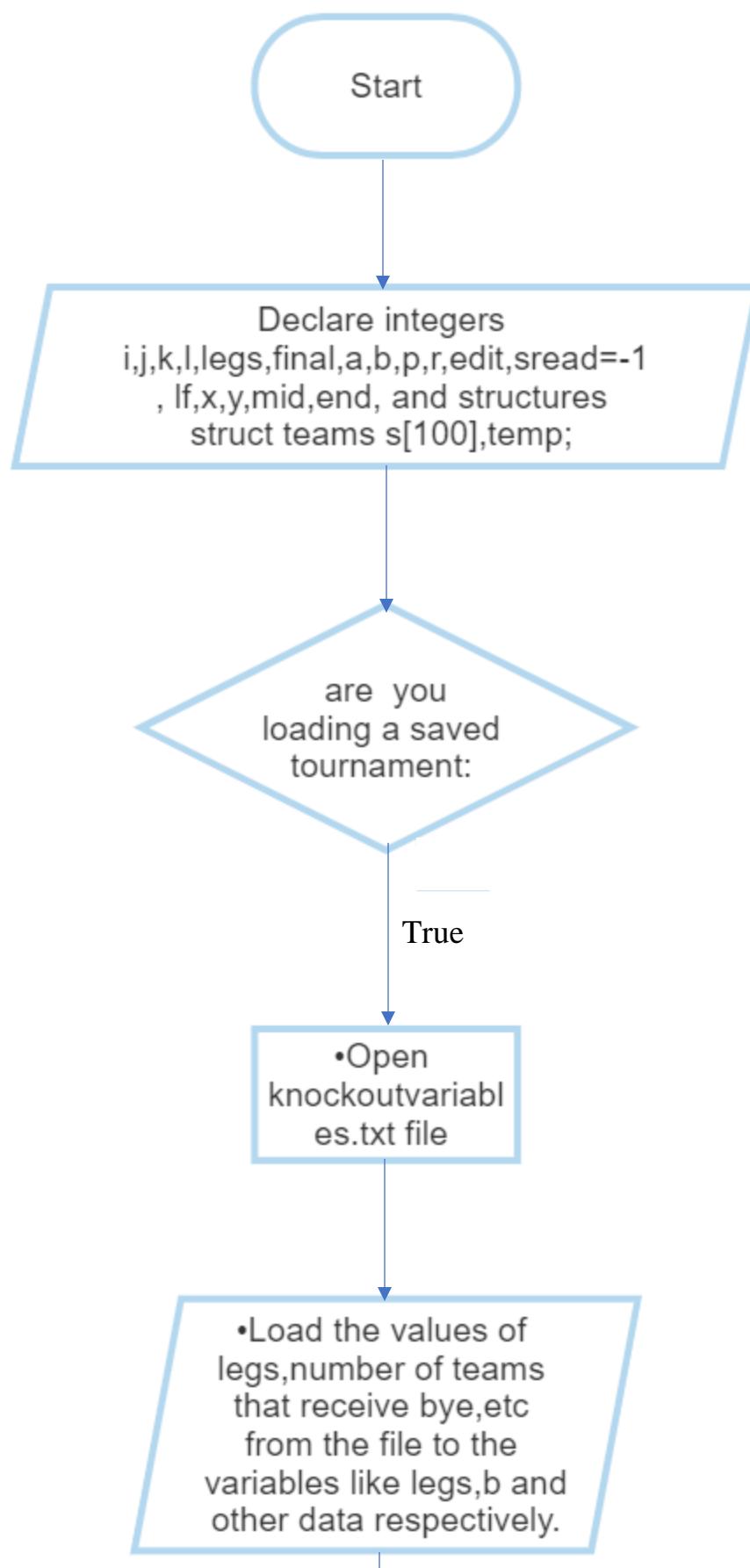
Even no. of teams:
 $\text{temp} = s[i]$
 $s[i] = s[i+1]$
 $s[i+1] = \text{temp}$ where
 $i = 0$ to $(n-3)$



Congratulate the winner
s[0].name
Present the cup

End

Flowchart for Knockout



•Open knockout teams.txt file and load the data of team to the structure team.

•If lf=1 then

True

Goto load1

False

Goto load2

Open file
match.txt

Display How
many times do
the teams play
each other?

Read the value
in legs variable

Display How many times do they play each other in the final?

Read in final variable.

Initialize the all s.check variable to 1.

Read the names of teams in s.name

Display Do you want to randomize?

True

Randomize using for loop

Calculate the number of teams that receive bye by using logic($b=2x - n$) where $n < 2x$ and x is a natural number.

Initialize aggregate goal values to zero.

Initialize $y = 0$
Load1:
Open knockoutvariables.txt
and knockout teams.txt

Display the teams that have received bye by using `for(i=0;i<b;i++)`

Is $n \leq 2$

True

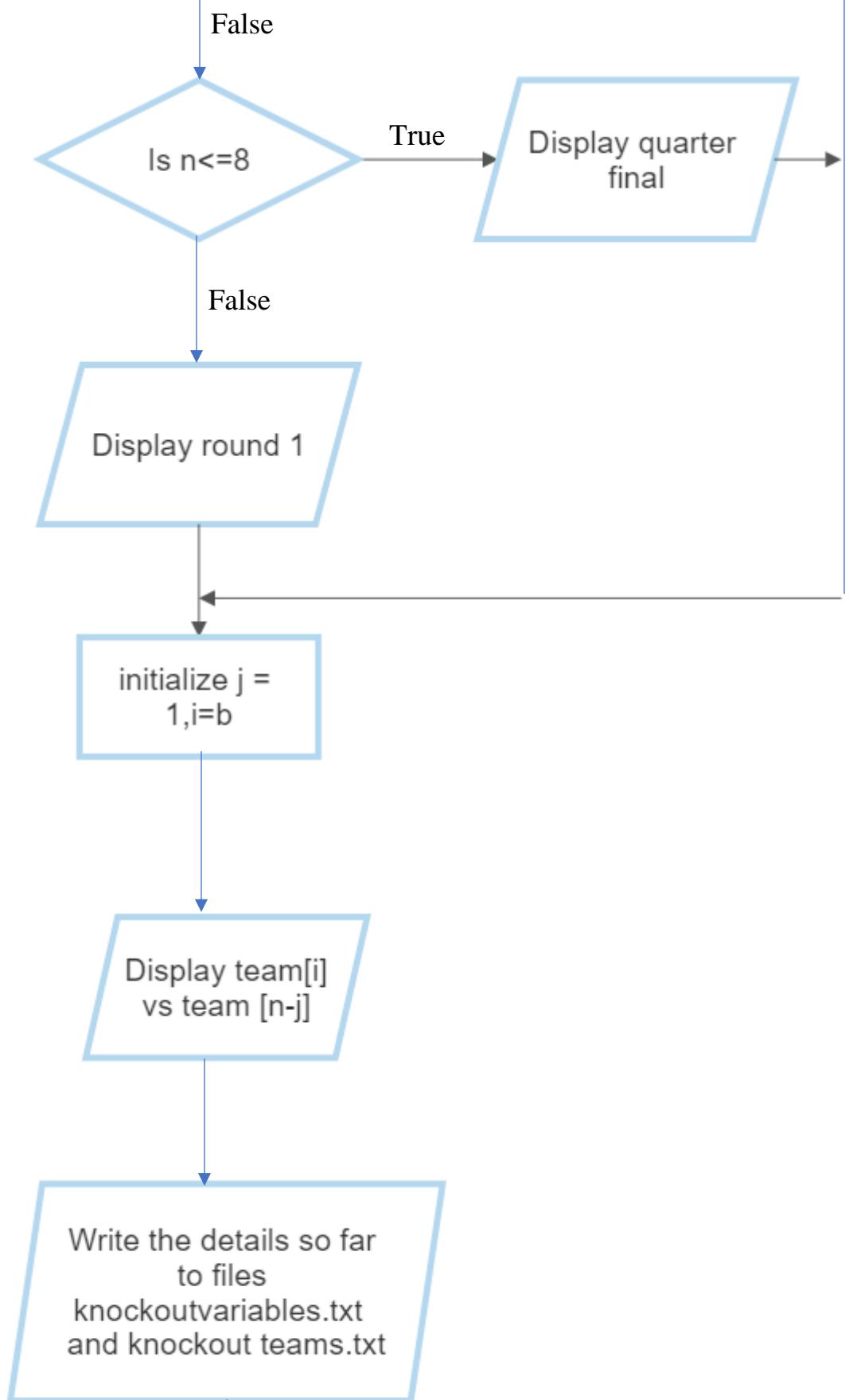
display final match

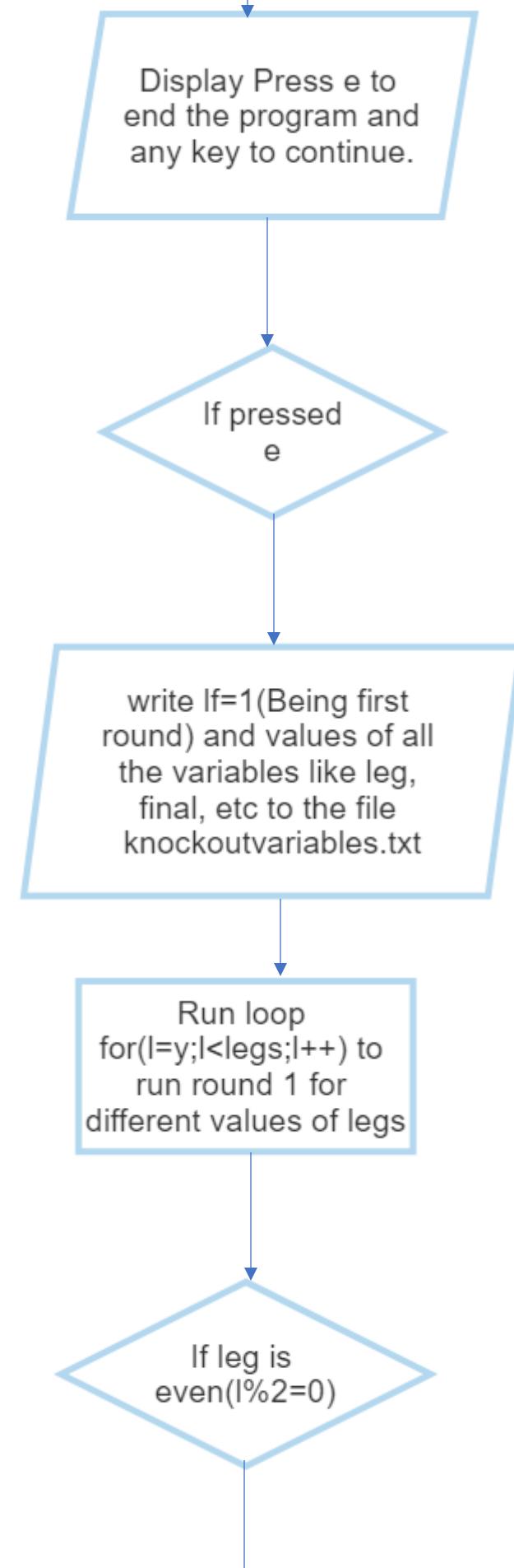
False

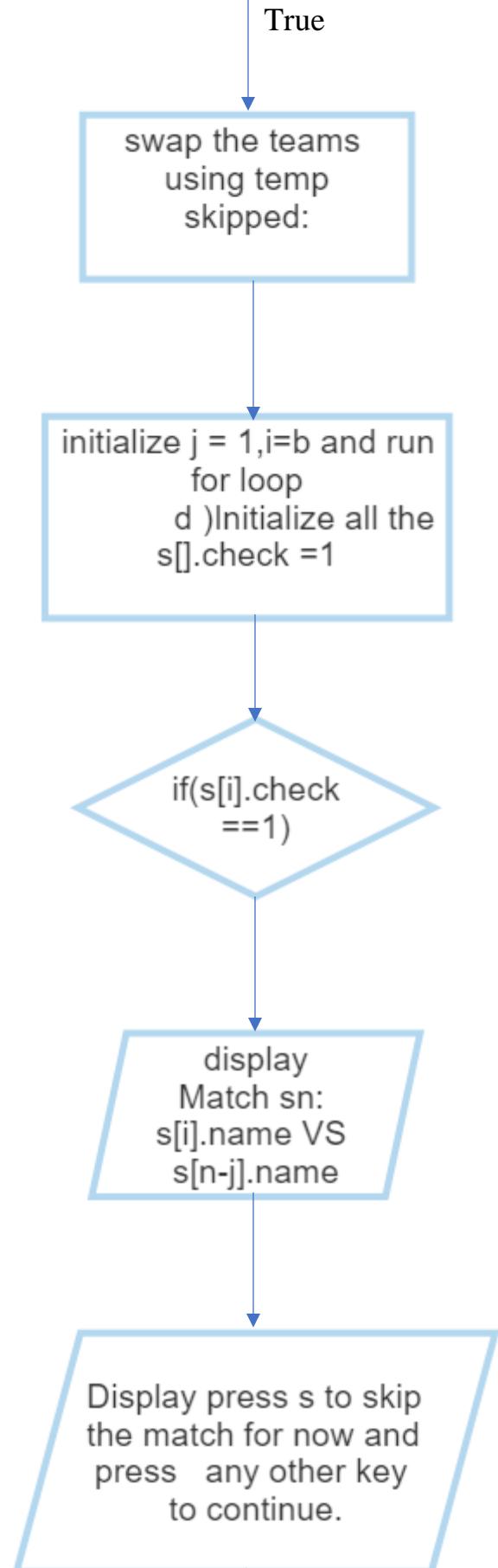
$n \leq 4$

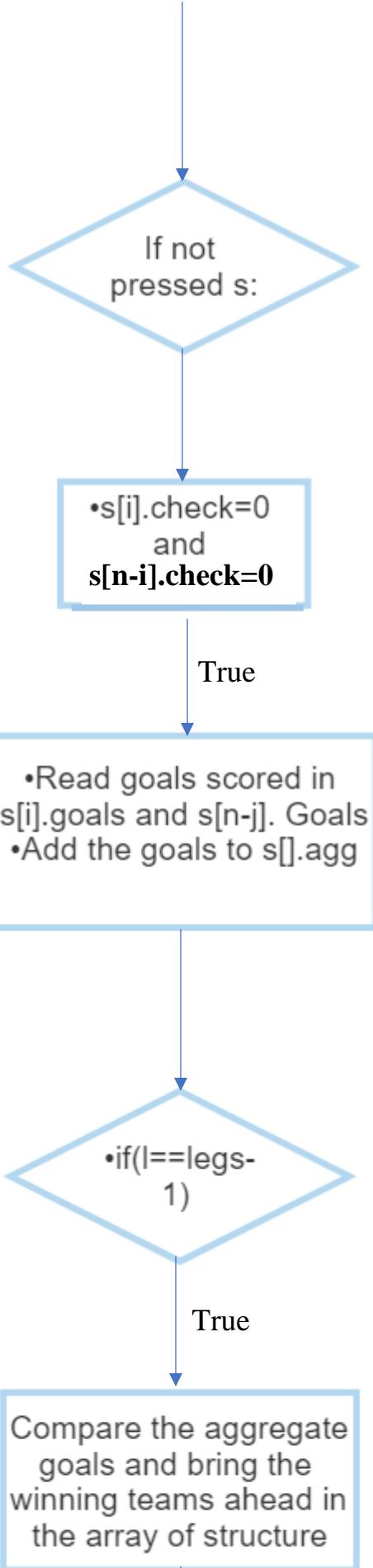
True

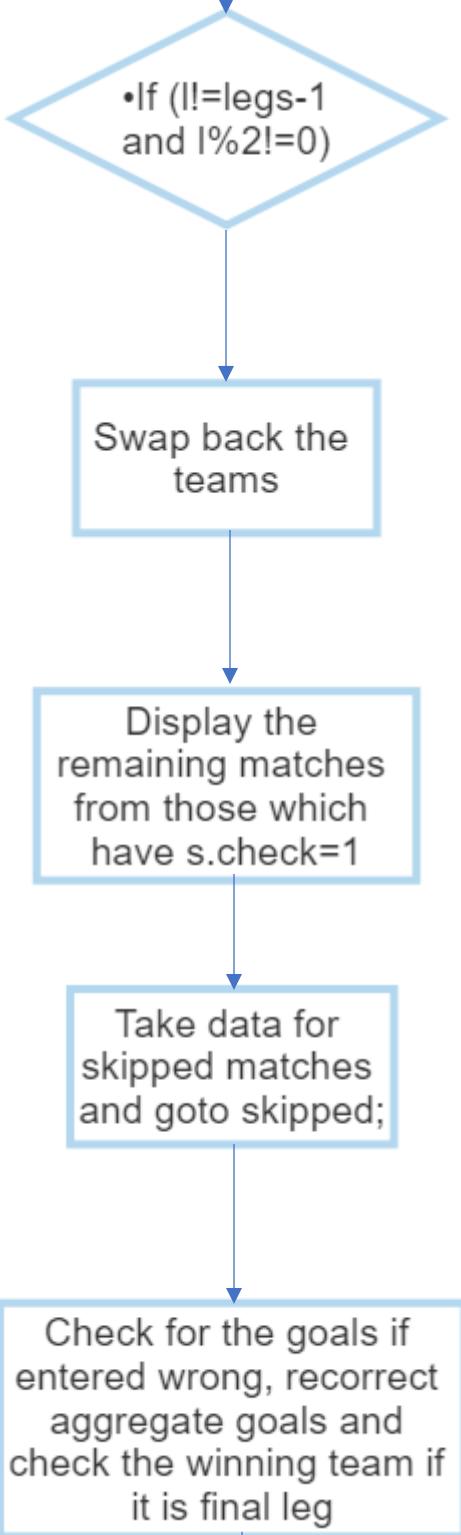
display semi final match

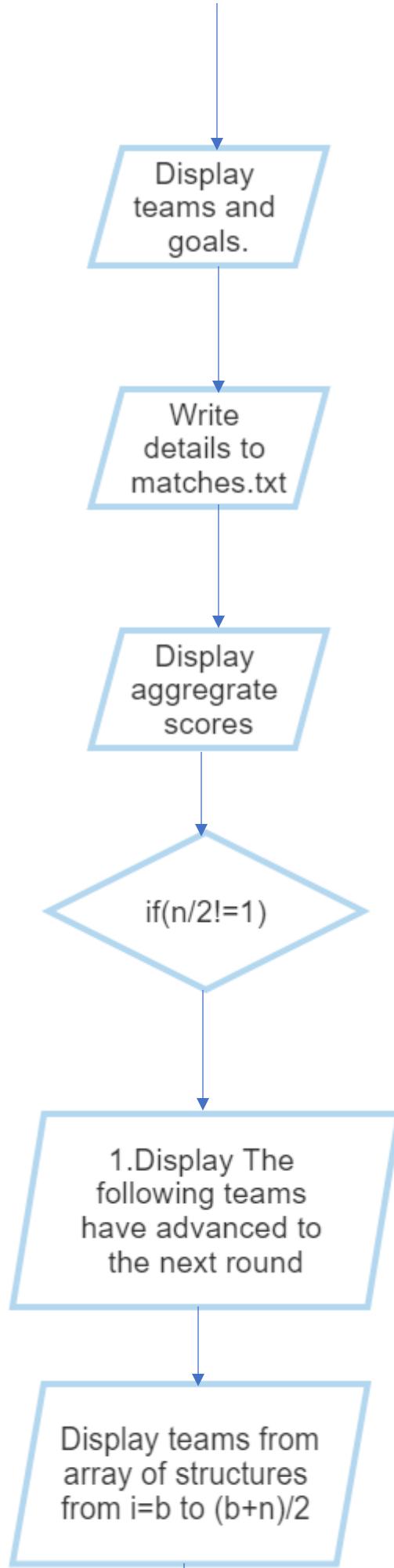


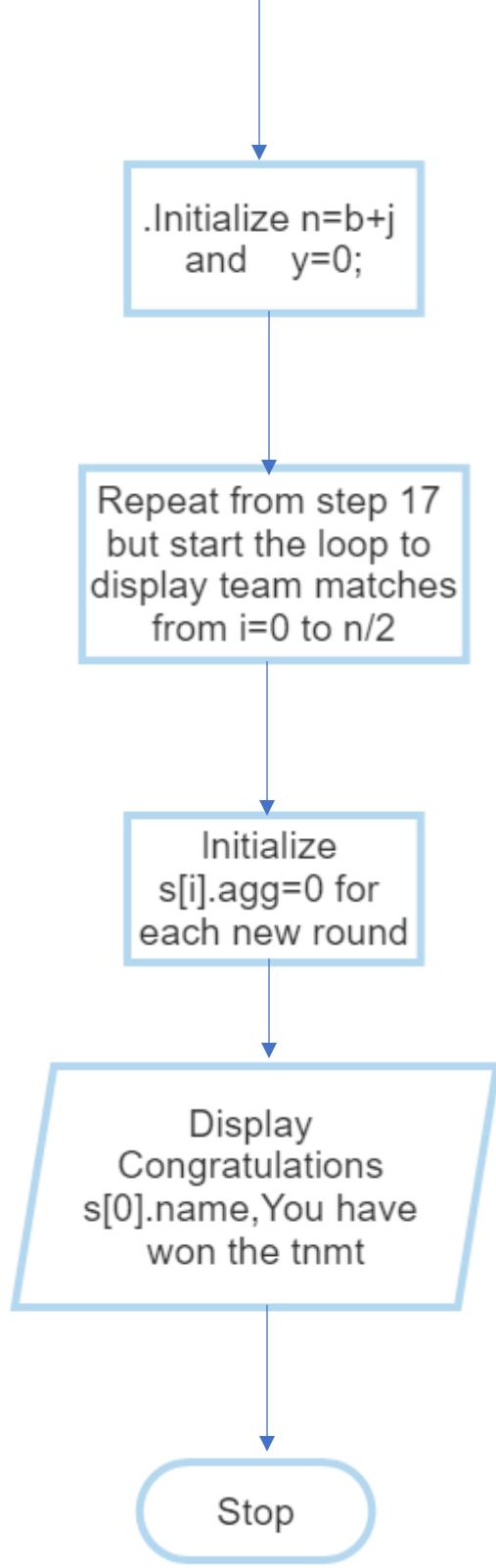




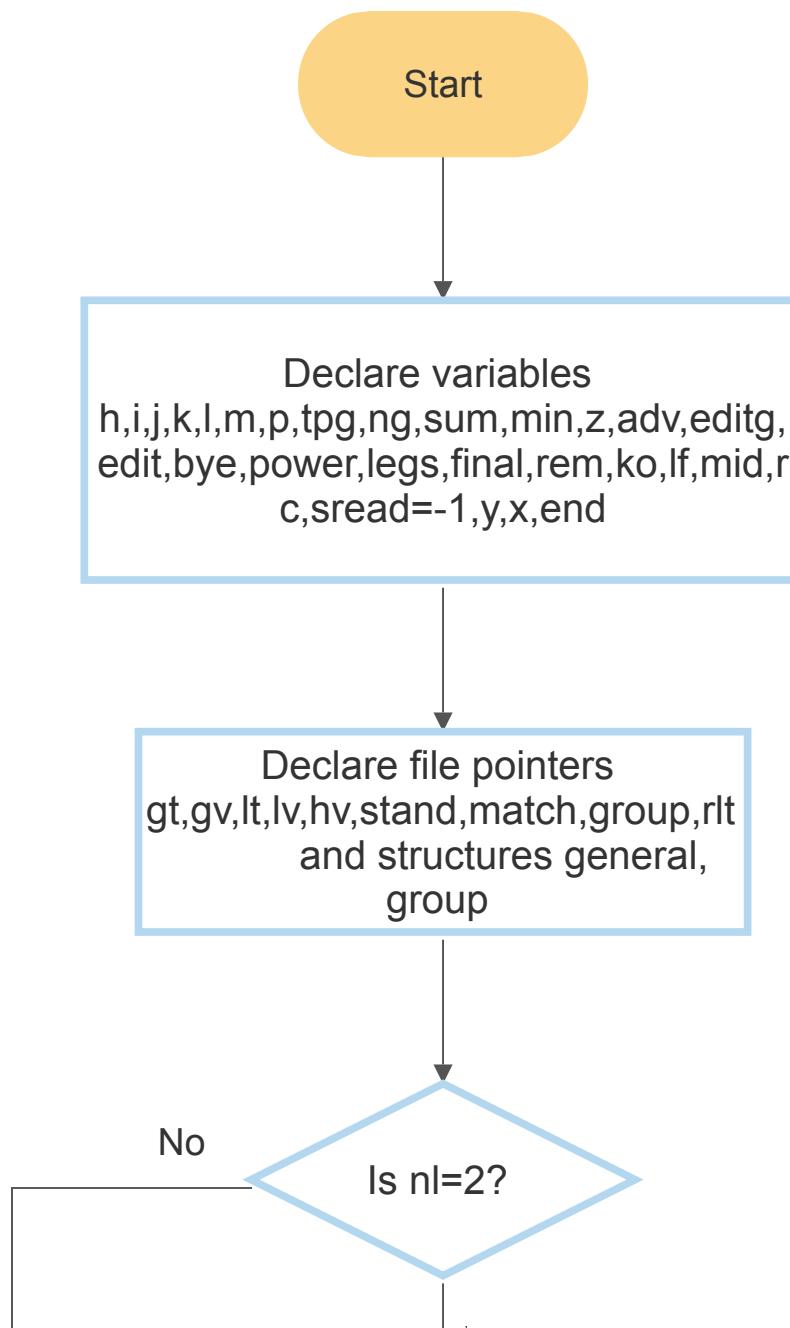


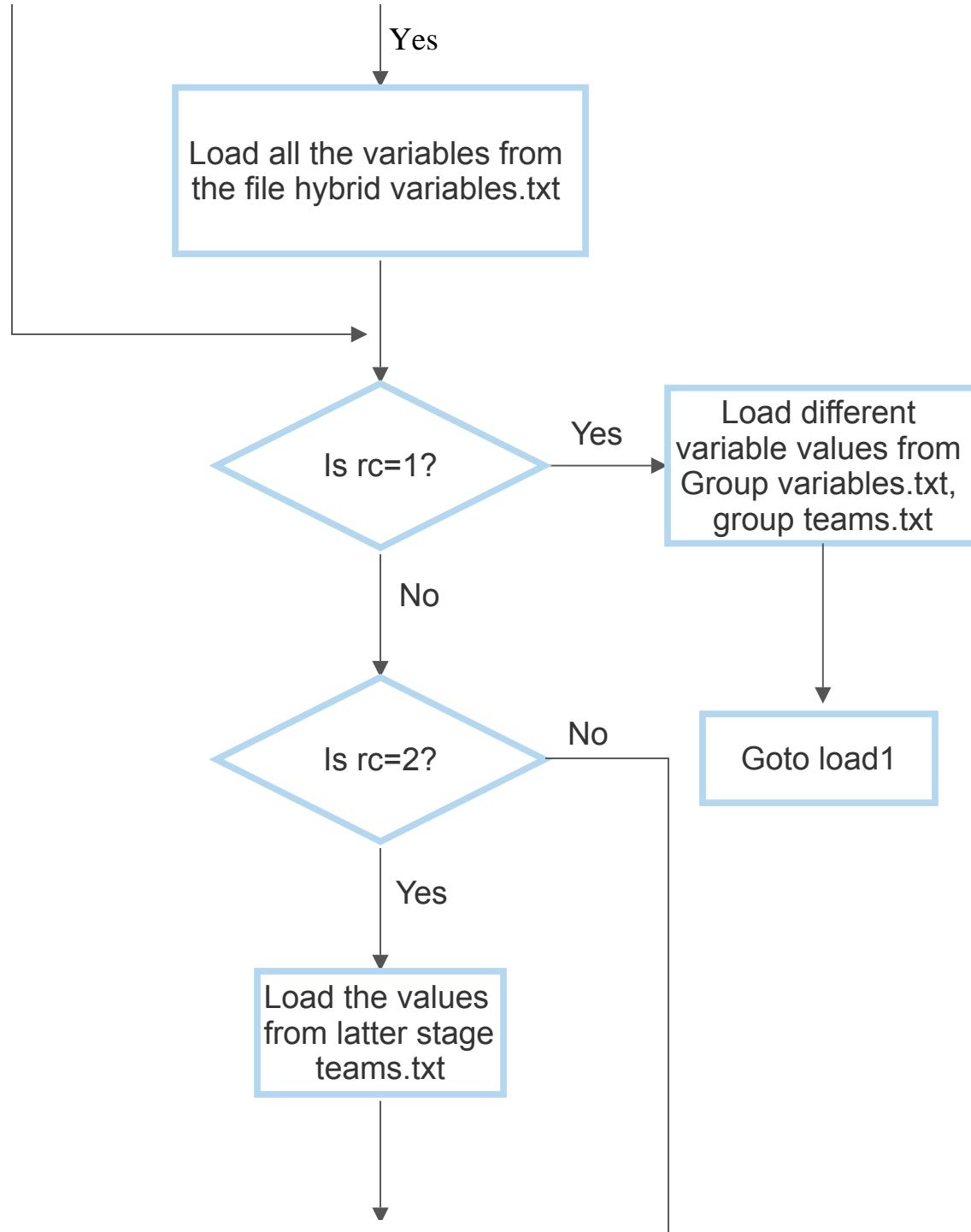


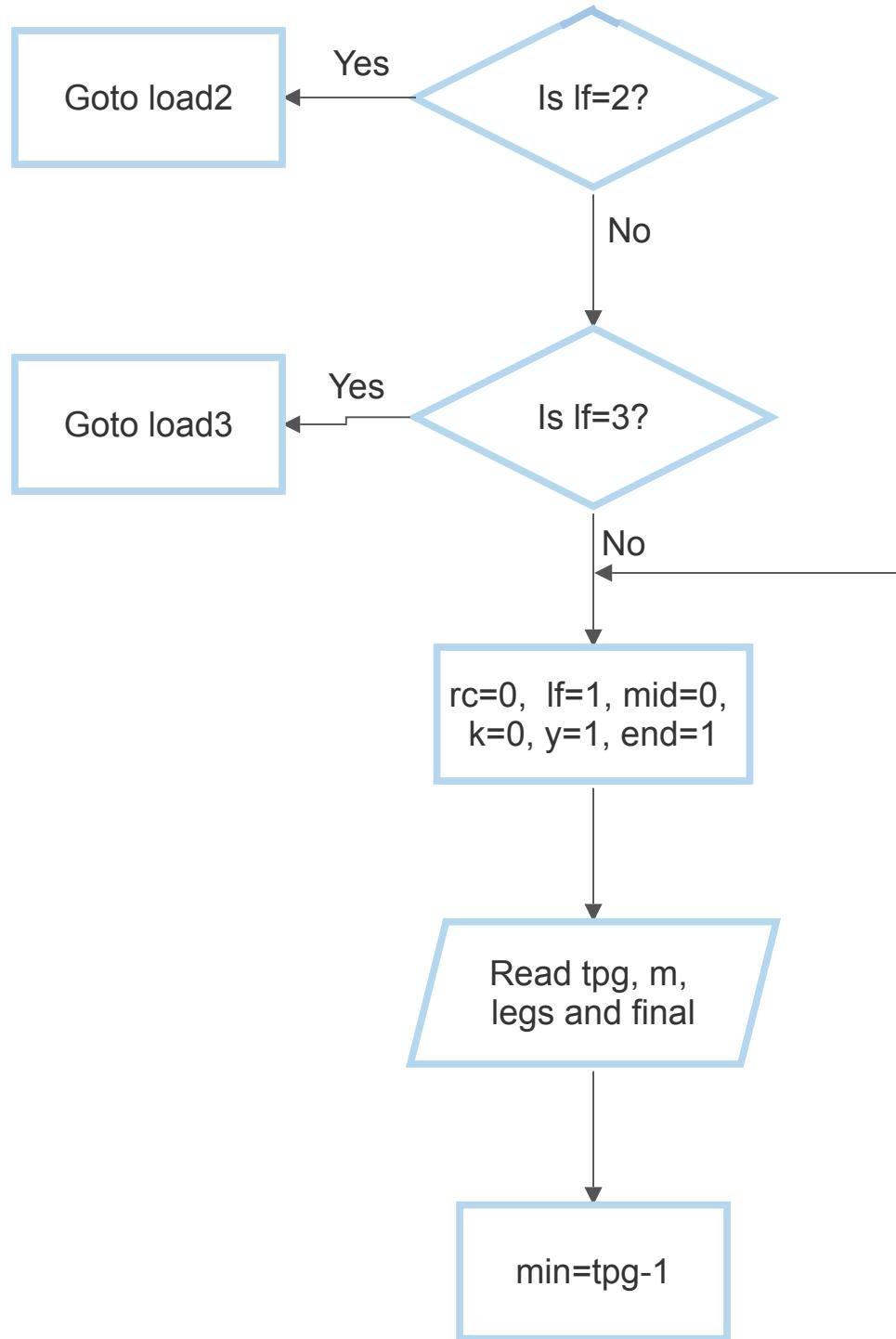


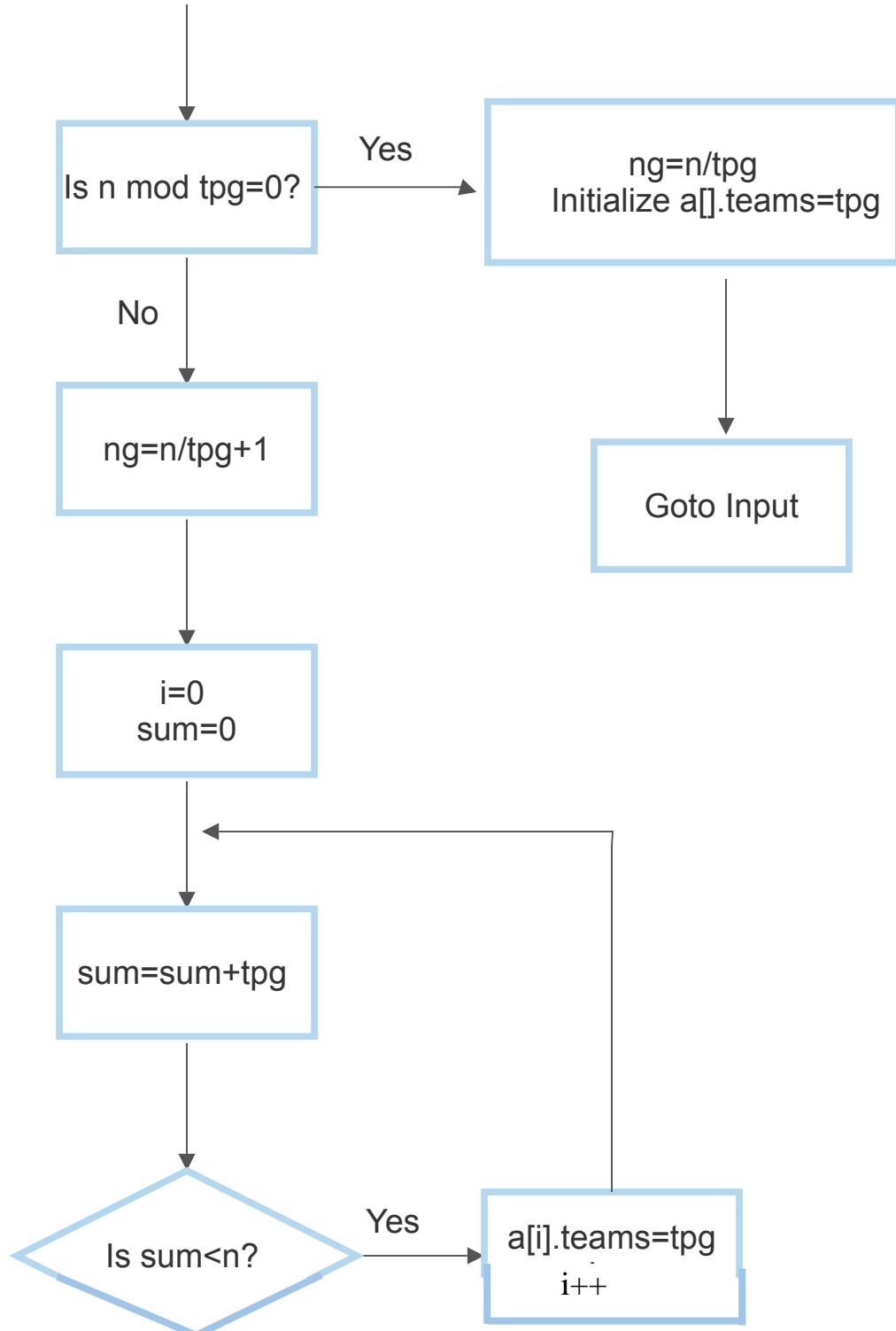


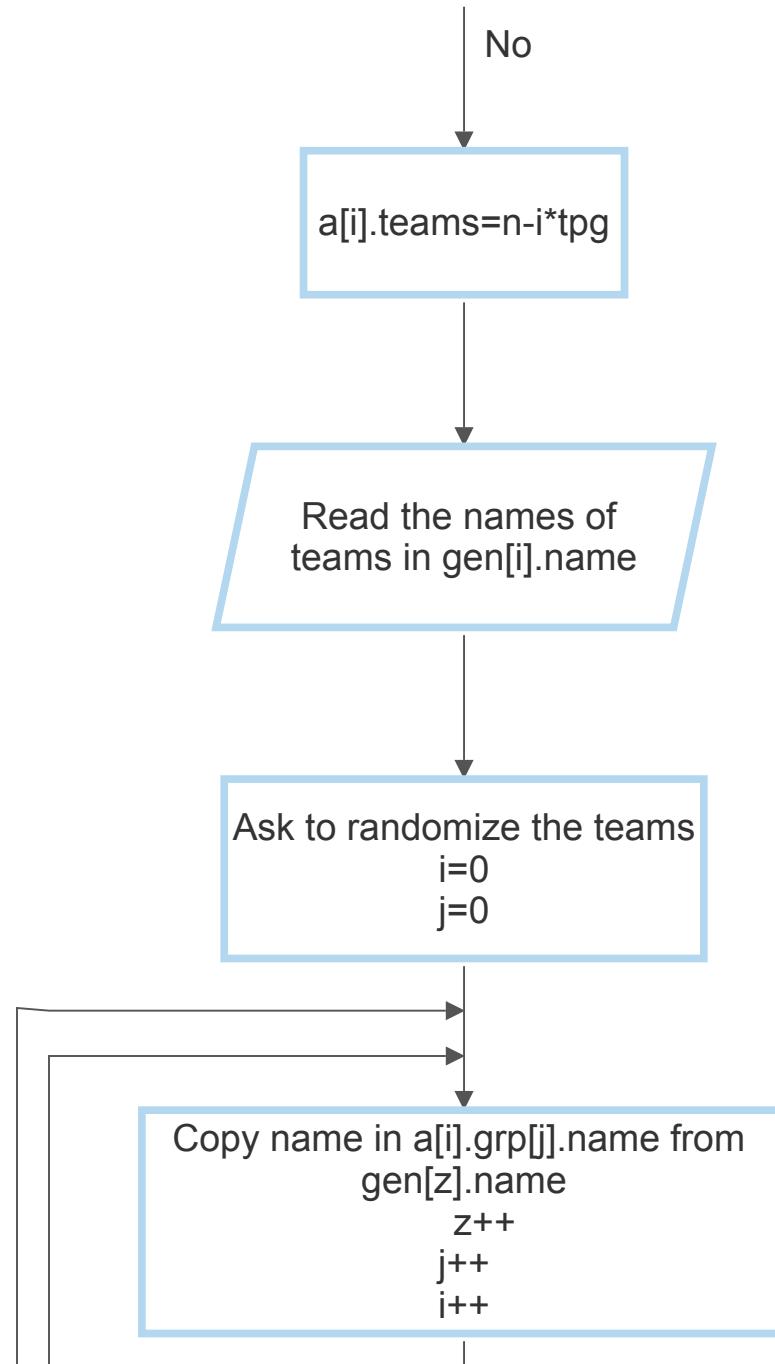
Flowchart for Hybrid

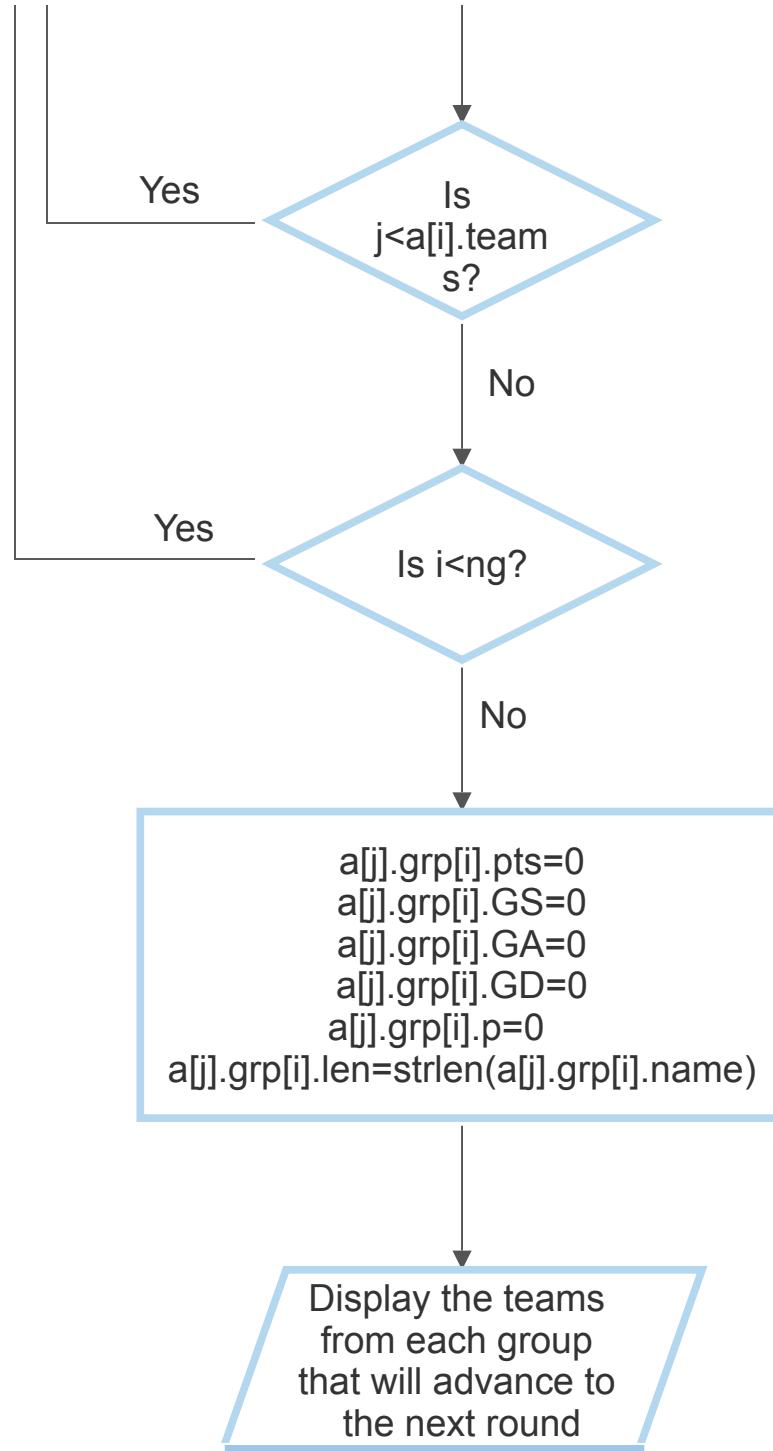


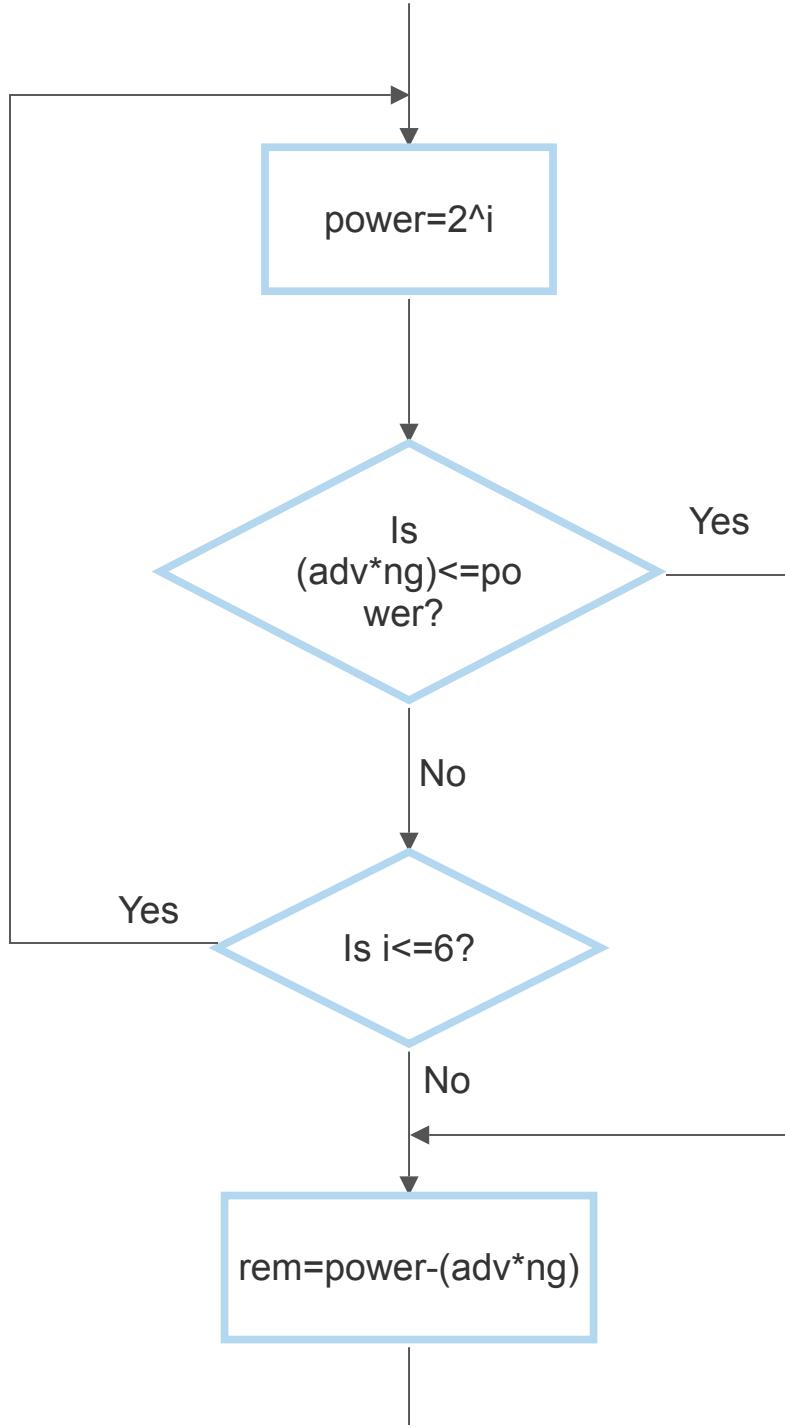


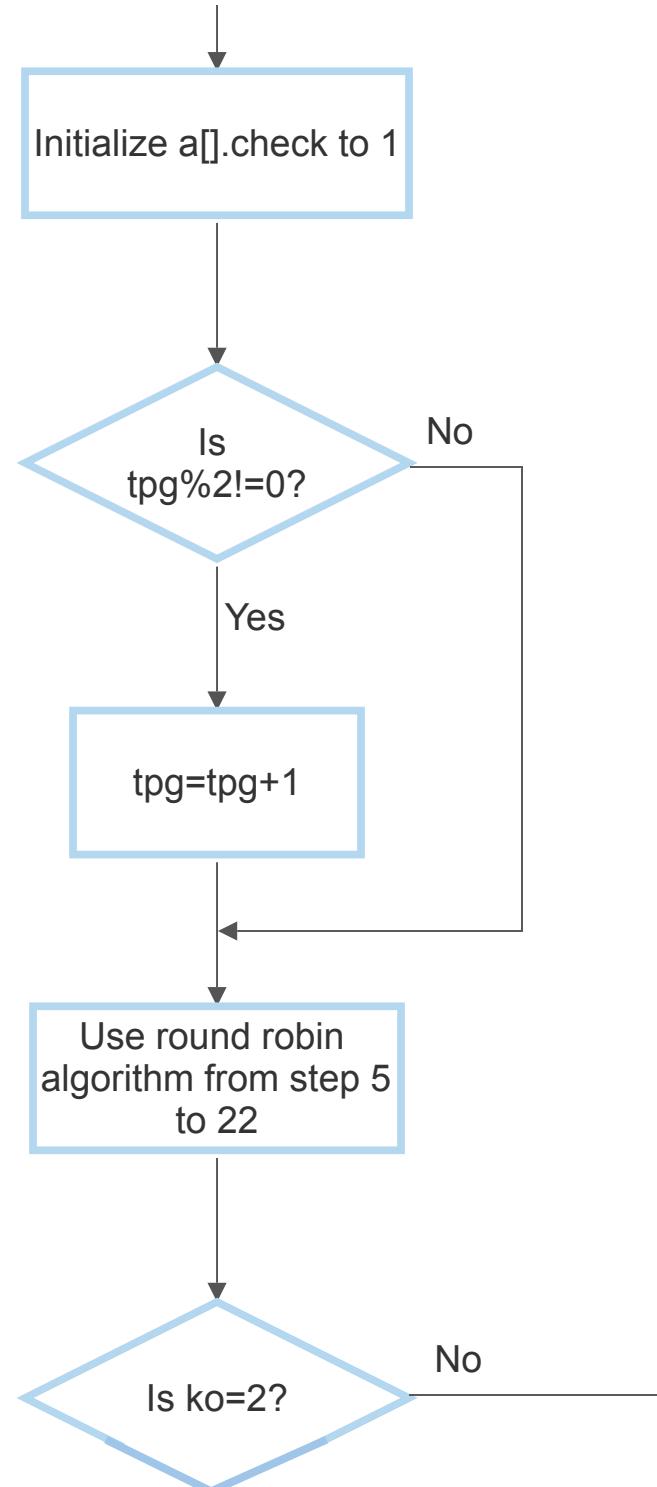












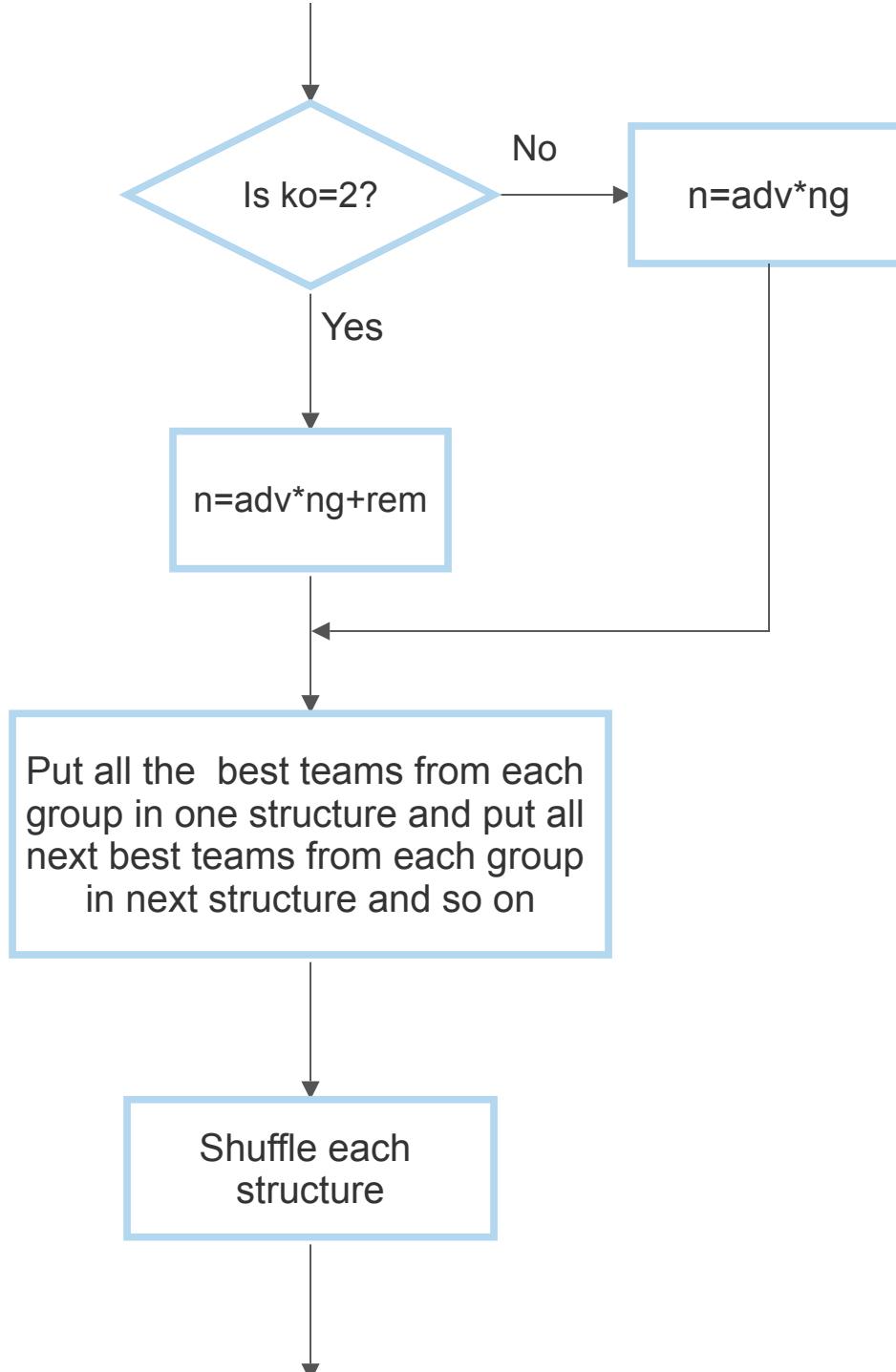
Yes

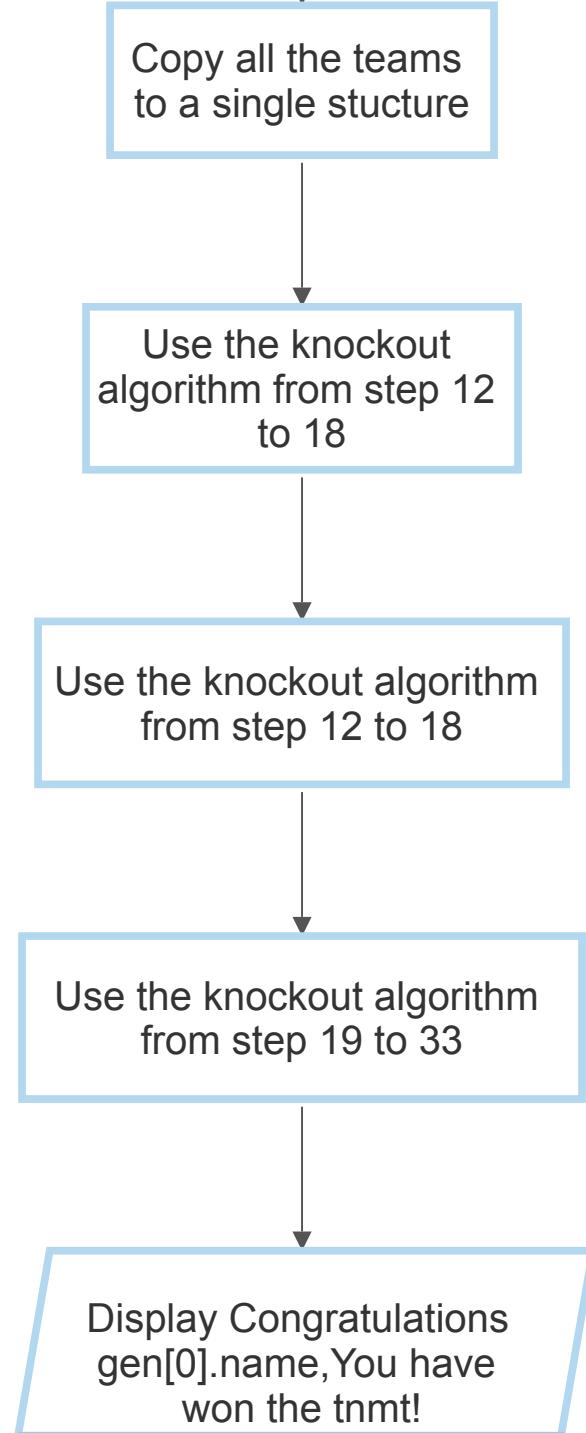
j=adv
Sort the teams in descending order of
their points
For equal points, check the goal difference

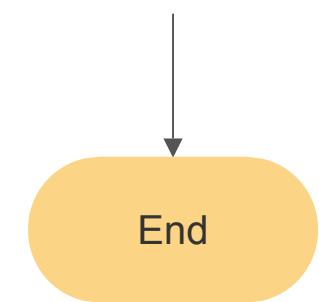
Display ranking
of next best
teams

Display the teams that
have advanced to the
next round

rc=1,y=0,
x=0,mid=0,end=1







Chapter 05

Results and Discussions

The program was run multiple times to demonstrate all of the features present in the program.

The results can be better understood with the help of the screenshots below:



This is the title screen of the program.

```
Choose the preferred option:  
1.Organize a Tournament  
2.Use the Stopwatch
```

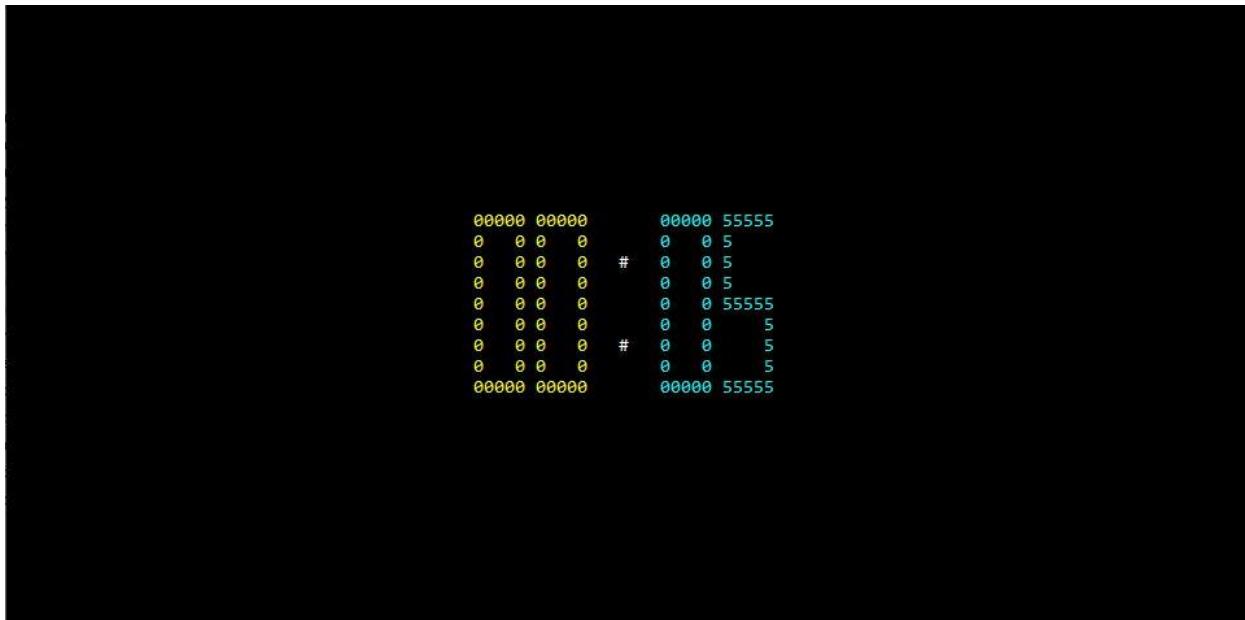
When the program starts, we can choose to organize a tournament or use the stopwatch feature.

Entering 1 will start the tournament organizer whereas entering 2 will start the stopwatch.

Stopwatch

```
Enter the Starting Minute: 00  
Enter the Starting Second: 00
```

If we select the stopwatch option, this screen will be displayed. We can enter the starting minute and starting second from which the stopwatch will start. Here, we have input 0 minute and 0 second.



The stopwatch will start from 00:00 and continue until we end the program.

```
Enter the Starting Minute: 45  
Enter the Starting Second: 0
```

If we enter 45 as the starting minute and 0 as the starting second, the program will start from 45:00 and run until we end the program.

```
4 4 55555      00000 4 4
4 4 5          0 0 4 4
4 4 5          # 0 0 4 4
4 4 5          0 0 4 4
44444 55555    0 0 44444
4 5          0 0 4
4 5          # 0 0 4
4 5          0 0 4
4 55555      00000 4
```

Tournament

```
Enter:
1.New Tournament
2.Load Tournament

Warning!!! Starting a new tournament will erase previous tournament.
```

When we start the tournament program, we can either start a completely new tournament or we can load a pre-existing tournament.

```
Enter the name of the tournament:
Super League
Enter the number of teams:
5
Choose the format of tournament:
1)League
2)Knockout
3)Round Robin and Knockout
1
```

When we start a new tournament, we can start setting up our tournament by entering the name of the tournament, the number of teams and the format of the tournament.

League

```
How many times do the teams play each other?  
2  
Enter the name of team 1:Manchester City  
Enter the name of team 2:Atletico Madrid  
Enter the name of team 3:Bayern Munich  
Enter the name of team 4:Inter Milan  
Enter the name of team 5:Lille
```

Let us begin with the league format first. We can enter how many times a team plays against the same opponent and then we can enter the names of the teams participating in the tournament.

```
Would you like to randomize the order of the teams?  
Press Y to randomize.  
Press any key to continue without randomizing.  
  
Randomized!  
  
Data has been saved!  
  
Press e to end the program.  
Press any other key to continue.
```

If we do not choose to randomize, the teams will be in the order in which their names were entered. Randomizing will change the order of the teams and hence differ the order in which the matches are played.

After randomizing or choosing not to randomize, the data will be saved and we can press e to end the program.

```
Matchday 1:  
Manchester City VS Inter Milan  
Lille VS Atletico Madrid  
  
Press e to end the program.  
Press any other key to continue.
```

If we continue the program, the fixtures of the 1st matchday are displayed.

```
Match 1:Manchester City VS Inter Milan
```

```
Press s to skip the match for now.  
Press any other key to continue.
```

```
Enter number of goals scored by Manchester City:2  
Enter number of goals scored by Inter Milan:0
```

```
Match 2:Lille VS Atletico Madrid
```

```
Press s to skip the match for now.  
Press any other key to continue.
```

```
Enter number of goals scored by Lille:1  
Enter number of goals scored by Atletico Madrid:1
```

```
Remaining matches:
```

```
Data has been saved!
```

```
Press e to end the program.  
Press any other key to continue
```

We can now begin the 1st matchday. For each match, the number of goals scored by the playing teams will be asked. After all the matches are completed, the data will be saved and we can end the program.

```
Manchester City 2-0 Inter Milan  
Lille 1-1 Atletico Madrid
```

```
Would you like to change any result of Matchday1?
```

```
Press Y to change the results.
```

```
Press any other key to continue without editing any of the results.
```

```
Matches have been recorded.
```

```
You can check the recorded matches by opening the text file matches.txt.
```

```
Press any key to continue.
```

At the end of each matchday, we also have the option to edit any of the results and correct them. For now, let's continue without editing. All of the matches of the matchday will be written in the text file and we can check the results at any time by simply opening the text file.

```
The standings at the end of matchday 1 is as follows:
```

#	Team	Played	GS	GA	GD	Points
1	Manchester City	1	2	0	+2	3
2	Lille	1	1	1	0	1
3	Atletico Madrid	1	1	1	0	1
4	Bayern Munich	0	0	0	0	0
5	Inter Milan	1	0	2	-2	0

```
Standings have been recorded.
```

```
You can check the text file standings.txt for viewing the standings at the end of the matchdays at any time.
```

```
Data has been saved!
```

The standings at the end of the matchday will be displayed and it will also be written in the text file from which we can check the standings at any time.

```
Match 1:Lille VS Bayern Munich
Press s to skip the match for now.
Press any other key to continue.

Match 2:Atletico Madrid VS Inter Milan
Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Atletico Madrid:1
Enter number of goals scored by Inter Milan:1

Remaining matches:
Lille VS Bayern Munich

Data has been saved!

Press e to end the program.
Press any other key to continue
```

Let's move on to the next matchday. You might have noticed the 'press s to skip the match for now' sentence earlier. Like it is stated, if we press 's', the match will be skipped and we can input the results of the next match first. After all the matches which were not skipped are completed, the skipped matches will be displayed. We can end the program here and when we load the program the next time, we only need to input the results of those skipped matches.

```
Match 1:Lille VS Bayern Munich
Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Lille:1
Enter number of goals scored by Bayern Munich:2

Remaining matches:
Data has been saved!

Press e to end the program.
Press any other key to continue
```

Now let's input the result of the remaining matches and end the matchday.

```

Lille 1-2 Bayern Munich
Atletico Madrid 1-1 Inter Milan

Would you like to change any result of Matchday2?

Press Y to change the results.
Press any other key to continue without editing any of the results.

```

The results are displayed and we can also choose to edit the results.

```

Choose the match number of the match whose outcome you want to change:
Match 1:Lille VS Bayern Munich
Match 2:Atletico Madrid VS Inter Milan
1
Match 1:Lille VS Bayern Munich
Enter number of goals scored by Lille:1
Enter number of goals scored by Bayern Munich:3

Lille 1-3 Bayern Munich
Atletico Madrid 1-1 Inter Milan

Would you like to change any result of Matchday2?

Press Y to change the results.
Press any other key to continue without editing any of the results.

Matches have been recorded.
You can check the recorded matches by opening the text file matches.txt.

Press any key to continue.

```

If we choose to edit, we will be asked the match which we want to edit. After choosing the match, we can input the goals scored by each team again. The new result is saved and displayed. We can choose to edit more matches or end the matchday.

```

The standings at the end of matchday 2 is as follows:
#   Team      Played  GS   GA   GD   Points
1   Bayern Munich    1     3     1    +2    3
2   Manchester City  1     2     0    +2    3
3   Atletico Madrid   2     2     2     0    2
4   Lille              2     2     4    -2    1
5   Inter Milan        2     1     3    -2    1

Standings have been recorded.
You can check the text file standings.txt for viewing the standings at the end of the matchdays at any time.

Data has been saved!

Matchday 3:
Atletico Madrid VS Manchester City
Inter Milan VS Bayern Munich

Press e to end the program.
Press any other key to continue.

```

Again, the standings at the end of the 2nd matchday is displayed and after seeing the fixtures of the next program, we can choose to end the program. Let's end the program here.

```
Enter:  
1.New Tournament  
2.Load Tournament  
  
Warning!!! Starting a new tournament will erase previous tournament.  
2
```

We have opened the program again and this time we will load and continue from where we left.

```
Data has been saved!  
  
Matchday 3:  
Atletico Madrid VS Manchester City  
Inter Milan VS Bayern Munich  
  
Press e to end the program.  
Press any other key to continue.
```

The fixtures are displayed once again and we can continue with our tournament. Now that we have seen all the features that are in the league format of the tournament , let's quickly complete the remaining matches of the tournament.

```
Data has been saved!  
  
Matchday 3:  
Atletico Madrid VS Manchester City  
Inter Milan VS Bayern Munich  
  
Press e to end the program.  
Press any other key to continue.  
  
Match 1:Atletico Madrid VS Manchester City  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Match 2:Inter Milan VS Bayern Munich  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Inter Milan:2  
Enter number of goals scored by Bayern Munich:1  
  
Remaining matches:  
Atletico Madrid VS Manchester City  
  
Data has been saved!  
  
Press e to end the program.  
Press any other key to continue
```

```

Matchday 3:
Atletico Madrid VS Manchester City
Inter Milan VS Bayern Munich

Press e to end the program.
Press any other key to continue.

Match 1:Atletico Madrid VS Manchester City

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Atletico Madrid:1
Enter number of goals scored by Manchester City:1

Remaining matches:

Data has been saved!

Press e to end the program.
Press any other key to continue

Atletico Madrid 1-1 Manchester City
Inter Milan 2-1 Bayern Munich

Would you like to change any result of Matchday3?

Press V to change the results.
Press any other key to continue without editing any of the results.

Matches have been recorded.
You can check the recorded matches by opening the text file matches.txt.

Press any key to continue.

```

```

The standings at the end of matchday 3 is as follows:
# Team Played GS GA GD Points
1 Manchester City 2 3 1 +2 4
2 Inter Milan 3 3 4 -1 4
3 Bayern Munich 2 4 3 +1 3
4 Atletico Madrid 3 3 0 3
5 Lille 2 2 4 -2 1

Standings have been recorded.
You can check the text file standings.txt for viewing the standings at the end of the matchdays at any time.

Data has been saved!

Matchday 4:
Inter Milan VS Lille
Bayern Munich VS Manchester City

Press e to end the program.
Press any other key to continue.

Match 1:Inter Milan VS Lille

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Inter Milan:2
Enter number of goals scored by Lille:1

Match 2:Bayern Munich VS Manchester City

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Bayern Munich:3
Enter number of goals scored by Manchester City:2

Remaining matches:

Data has been saved!

Press e to end the program.
Press any other key to continue

```

```

Inter Milan 2-1 Lille
Bayern Munich 3-2 Manchester City

Would you like to change any result of Matchday4?

Press V to change the results.
Press any other key to continue without editing any of the results.

Matches have been recorded.
You can check the recorded matches by opening the text file matches.txt.

Press any key to continue.

```

```

The standings at the end of matchday 4 is as follows:
#      Team          Played   GS    GA    GD    Points
1     Inter Milan    4       5     5     0     7
2     Bayern Munich  3       7     5     +2    6
3     Manchester City 3       5     4     +1    4
4     Atletico Madrid 3       3     3     0     3
5     Lille           3       3     6     -3    1

Standings have been recorded.
You can check the text file standings.txt for viewing the standings at the end of the matchdays at any time.

Data has been saved!

Matchday 5:
Bayern Munich VS Atletico Madrid
Manchester City VS Lille

Press e to end the program.
Press any other key to continue.

Match 1:Bayern Munich VS Atletico Madrid

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Bayern Munich:2
Enter number of goals scored by Atletico Madrid:0

Match 2:Manchester City VS Lille

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Manchester City:4
Enter number of goals scored by Lille:1

Remaining matches:

Data has been saved!

Press e to end the program.
Press any other key to continue

```

```

Bayern Munich 2-0 Atletico Madrid
Manchester City 4-1 Lille

Would you like to change any result of Matchday5?

Press V to change the results.
Press any other key to continue without editing any of the results.

Matches have been recorded.
You can check the recorded matches by opening the text file matches.txt.

Press any key to continue.

```

```

The standings at the end of matchday 5 is as follows:
#      Team          Played   GS    GA    GD    Points
1     Bayern Munich  4       9     5     +4    9
2     Manchester City 4       9     5     +4    7
3     Inter Milan    4       5     5     0     7
4     Atletico Madrid 4       3     5     -2    3
5     Lille           4       4     10    -6    1

Standings have been recorded.
You can check the text file standings.txt for viewing the standings at the end of the matchdays at any time.

Data has been saved!

Matchday 6:
Inter Milan VS Manchester City
Atletico Madrid VS Lille

Press e to end the program.
Press any other key to continue.

```

All of the teams have played each other once. As we chose that the teams would play each other twice while setting up the tournament, the reverse fixtures will now begin. Notice that the team whose name was first in the 1st matchday in the game between the same two teams will be second and vice versa. Here, We had Manchester City VS Inter in the first time these teams played each other. But, in matchday six, we have Inter VS Manchester City. This is done so that each team will play the ‘home’ game once and the ‘away’ game once when they face each other twice.

```
Match 1:Inter Milan VS Manchester City
Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Inter Milan:1
Enter number of goals scored by Manchester City:0

Match 2:Atletico Madrid VS Lille
Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Atletico Madrid:2
Enter number of goals scored by Lille:1

Remaining matches:
Data has been saved!

Press e to end the program.
Press any other key to continue

Inter Milan 1-0 Manchester City
Atletico Madrid 2-1 Lille

Would you like to change any result of Matchday6?

Press Y to change the results.
Press any other key to continue without editing any of the results.

Matches have been recorded.
You can check the recorded matches by opening the text file matches.txt.

Press any key to continue.
```

```
The standings at the end of matchday 6 is as follows:
# Team Played GS GA GD Points
1 Inter Milan 5 6 5 +1 16
2 Bayern Munich 4 9 5 +4 9
3 Manchester City 5 9 6 +3 7
4 Atletico Madrid 5 5 6 -1 6
5 Lille 5 5 12 -7 1

Standings have been recorded.
You can check the text file standings.txt for viewing the standings at the end of the matchdays at any time.

Data has been saved!

Matchday 7:
Bayern Munich VS Lille
Inter Milan VS Atletico Madrid

Press e to end the program.
Press any other key to continue.

Match 1:Bayern Munich VS Lille

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Bayern Munich:5
Enter number of goals scored by Lille:0

Match 2:Inter Milan VS Atletico Madrid

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Inter Milan:2
Enter number of goals scored by Atletico Madrid:2

Remaining matches:
Data has been saved!

Press e to end the program.
Press any other key to continue
```

```
Bayern Munich 5-0 Lille
Inter Milan 2-2 Atletico Madrid

Would you like to change any result of Matchday7?

Press Y to change the results.
Press any other key to continue without editing any of the results.

Matches have been recorded.
You can check the recorded matches by opening the text file matches.txt.

Press any key to continue.
```

```

The standings at the end of matchday 7 is as follows:
#      Team          Played  GS   GA   GD   Points
1  Bayern Munich      5     14    5   +9    12
2  Inter Milan        6     8     7   +1    11
3  Manchester City    5     9     6   +3    7
4  Atletico Madrid    6     7     8   -1    7
5  Lille               6     5    17  -12    1

Standings have been recorded.
You can check the text file standings.txt for viewing the standings at the end of the matchdays at any time.

Data has been saved!

Matchday 8:
Manchester City VS Atletico Madrid
Bayern Munich VS Inter Milan

Press e to end the program.
Press any other key to continue.

Match 1:Manchester City VS Atletico Madrid

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Manchester City:3
Enter number of goals scored by Atletico Madrid:1

Match 2:Bayern Munich VS Inter Milan

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Bayern Munich:3
Enter number of goals scored by Inter Milan:2

Remaining matches:

Data has been saved!

Press e to end the program.
Press any other key to continue

```

```

The standings at the end of matchday 8 is as follows:
#      Team          Played  GS   GA   GD   Points
1  Bayern Munich      6     17    7   +10   15
2  Inter Milan        7     10   10   0    11
3  Manchester City    6     12    7   +5    10
4  Atletico Madrid    7     8    11   -3    7
5  Lille               6     5    17  -12    1

Standings have been recorded.
You can check the text file standings.txt for viewing the standings at the end of the matchdays at any time.

Data has been saved!

Matchday 9:
Lille VS Inter Milan
Manchester City VS Bayern Munich

Press e to end the program.
Press any other key to continue.

Match 1:Lille VS Inter Milan

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Lille:2
Enter number of goals scored by Inter Milan:1

Match 2:Manchester City VS Bayern Munich

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Manchester City:2
Enter number of goals scored by Bayern Munich:1

Remaining matches:

Data has been saved!

Press e to end the program.
Press any other key to continue

```

```

Lille 2-1 Inter Milan
Manchester City 2-1 Bayern Munich

Would you like to change any result of Matchday9?

Press Y to change the results.
Press any other key to continue without editing any of the results.

Matches have been recorded.
You can check the recorded matches by opening the text file matches.txt.

Press any key to continue.

```

```

The standings at the end of matchday 9 is as follows:
#      Team          Played  GS   GA   GD   Points
1    Bayern Munich    7     18    9    +9    15
2    Manchester City  7     14    8    +6    13
3    Inter Milan      8     11   12    -1    11
4    Atletico Madrid   7     8    11    -3    7
5    Lille              7     7    18   -11    4

Standings have been recorded.
You can check the text file standings.txt for viewing the standings at the end of the matchdays at any time.

Data has been saved!

Matchday 10:
Atletico Madrid VS Bayern Munich
Lille VS Manchester City

Press e to end the program.
Press any other key to continue.

Match 1:Atletico Madrid VS Bayern Munich

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Atletico Madrid:1
Enter number of goals scored by Bayern Munich:0

Match 2:Lille VS Manchester City

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Lille:1
Enter number of goals scored by Manchester City:4

Remaining matches:

Data has been saved!

Press e to end the program.
Press any other key to continue

```

```

Atletico Madrid 1-0 Bayern Munich
Lille 1-4 Manchester City

Would you like to change any result of Matchday10?

Press V to change the results.
Press any other key to continue without editing any of the results.

Matches have been recorded.
You can check the recorded matches by opening the text file matches.txt.

Press any key to continue.

```

```

The standings at the end of matchday 10 is as follows:
#      Team          Played  GS   GA   GD   Points
1    Manchester City  8     18    9    +9    16
2    Bayern Munich     8     18   10    +8    15
3    Inter Milan       8     11   12    -1    11
4    Atletico Madrid    8     9    11    -2    10
5    Lille              8     8    22   -14    4

Standings have been recorded.
You can check the text file standings.txt for viewing the standings at the end of the matchdays at any time.

Congratulations Manchester City! You have won the Super League.

@ ##### @
@ ##### @
@ ##### @
@ ##### @
    ###
    #
    ##
    ##

Press any key to end the program.

```

After all the teams have played each other twice, the tournament finally comes to an end. After the standings at the end of the league is displayed, the program will announce the team with the highest point as the winner and a trophy is displayed on the console.

```
matches - Notepad
File Edit Format View Help
Matchday 1:
Manchester City 2-0 Inter Milan
Lille 1-1 Atletico Madrid

Matchday 2:
Lille 1-3 Bayern Munich
Atletico Madrid 1-1 Inter Milan

Matchday 3:
Atletico Madrid 1-1 Manchester City
Inter Milan 2-1 Bayern Munich

Matchday 4:
Inter Milan 2-1 Lille
Bayern Munich 3-2 Manchester City

Matchday 5:
Bayern Munich 2-0 Atletico Madrid
Manchester City 4-1 Lille

Matchday 6:
Inter Milan 1-0 Manchester City
Atletico Madrid 2-1 Lille

Matchday 7:
Bayern Munich 5-0 Lille
Inter Milan 2-2 Atletico Madrid

Matchday 8:
Manchester City 3-1 Atletico Madrid
Bayern Munich 3-2 Inter Milan

Matchday 9:
Lille 2-1 Inter Milan
Manchester City 2-1 Bayern Munich

Matchday 10:
Atletico Madrid 1-0 Bayern Munich
Lille 1-4 Manchester City
```

We can see that all of the matches of the tournament have been recorded.

The standings at the end of matchday 1 is as follows:

#	Team	Played	GS	GA	GD	Points
1	Manchester City	1	2	0	+2	3
2	Lille	1	1	1	0	1
3	Atletico Madrid	1	1	1	0	1
4	Bayern Munich	0	0	0	0	0
5	Inter Milan	1	0	2	-2	0

The standings at the end of matchday 2 is as follows:

#	Team	Played	GS	GA	GD	Points
1	Bayern Munich	1	3	1	+2	3
2	Manchester City	1	2	0	+2	3
3	Atletico Madrid	2	2	2	0	2
4	Lille	2	2	4	-2	1
5	Inter Milan	2	1	3	-2	1

The standings at the end of matchday 3 is as follows:

#	Team	Played	GS	GA	GD	Points
1	Manchester City	2	3	1	+2	4
2	Inter Milan	3	3	4	-1	4
3	Bayern Munich	2	4	3	+1	3
4	Atletico Madrid	3	3	3	0	3
5	Lille	2	2	4	-2	1

The standings at the end of matchday 4 is as follows:

#	Team	Played	GS	GA	GD	Points
1	Inter Milan	4	5	5	0	7
2	Bayern Munich	3	7	5	+2	6
3	Manchester City	3	5	4	+1	4
4	Atletico Madrid	3	3	3	0	3
5	Lille	3	3	6	-3	1

The standings at the end of matchday 5 is as follows:

#	Team	Played	GS	GA	GD	Points
1	Bayern Munich	4	9	5	+4	9
2	Manchester City	4	9	5	+4	7
3	Inter Milan	4	5	5	0	7
4	Atletico Madrid	4	3	5	-2	3
5	Lille	4	4	10	-6	1

The standings at the end of matchday 6 is as follows:

#	Team	Played	GS	GA	GD	Points
1	Inter Milan	5	6	5	+1	10
2	Bayern Munich	4	9	5	+4	9
3	Manchester City	5	9	6	+3	7
4	Atletico Madrid	5	5	6	-1	6
5	Lille	5	5	12	-7	1

The standings at the end of matchday 7 is as follows:

#	Team	Played	GS	GA	GD	Points
1	Bayern Munich	5	14	5	+9	12
2	Inter Milan	6	8	7	+1	11
3	Manchester City	5	9	6	+3	7
4	Atletico Madrid	6	7	8	-1	7
5	Lille	6	5	17	-12	1

The standings at the end of matchday 8 is as follows:

#	Team	Played	GS	GA	GD	Points
1	Bayern Munich	6	17	7	+10	15
2	Inter Milan	7	10	10	0	11
3	Manchester City	6	12	7	+5	10
4	Atletico Madrid	7	8	11	-3	7
5	Lille	6	5	17	-12	1

The standings at the end of matchday 9 is as follows:

#	Team	Played	GS	GA	GD	Points
1	Bayern Munich	7	18	9	+9	15
2	Manchester City	7	14	8	+6	13

#	Team	Played	GS	GA	GD	Points
3	Inter Milan	8	11	12	-1	11
4	Atletico Madrid	7	8	11	-3	7
5	Lille	7	7	18	-11	4

The standings at the end of matchday 10 is as follows:

#	Team	Played	GS	GA	GD	Points
1	Manchester City	8	18	9	+9	16
2	Bayern Munich	8	18	10	+8	15
3	Inter Milan	8	11	12	-1	11
4	Atletico Madrid	8	9	11	-2	10
5	Lille	8	8	22	-14	4

Similarly, the standings at the end of each matchday has also been recorded.

Knockout

```
Enter the name of the tournament:  
Pulchowk Cup  
Enter the number of teams:  
12  
Choose the format of tournament:  
1)League  
2)Knockout  
3)Round Robin and Knockout  
2
```

Now, let's start a new knockout tournament.

```
How many times do the teams play each other?  
2  
How many times do they play each other in the final?  
1
```

We can choose the number of times each team plays against each other in a knockout tie. We can choose the number of legs in the final match separately.

```
Enter the name of team 1:Civil A/B  
Enter the name of team 2:Civil C/D  
Enter the name of team 3:Civil E/F  
Enter the name of team 4:Civil G/H  
Enter the name of team 5:Arch  
Enter the name of team 6:Electrical  
Enter the name of team 7:Electronics  
Enter the name of team 8:Mechanical  
Enter the name of team 9:Computer A/B  
Enter the name of team 10:Computer C/D  
Enter the name of team 11:Aerospace  
Enter the name of team 12:Chemical
```

Let's enter the name of the participating teams.

```
Would you like to randomize the order of the teams?  
Press Y to randomize  
Press any other key to continue without randomizing.  
Randomized!!!  
Press any key to continue.
```

We can randomize the order of the teams.

```
The following teams have received bye to the next round:  
Electronics  
Aerospace  
Computer A/B  
Electrical  
  
Round 1:  
Mechanical VS Chemical  
Civil E/F VS Computer C/D  
Civil G/H VS Civil A/B  
Civil C/D VS Arch  
  
Data has been saved!  
  
Press e to end the program.  
Press any other key to continue
```

As there are 12 teams in the tournament, for the knockout to proceed smoothly and end up in a final match with two teams remaining, adjustments have to be made. The best way to maintain the structure of the tournament is to give byes to a certain number of teams. The program calculates the number of teams that receive bye to the next round and the remaining teams will play in the first round. The teams that received a bye to the next round will be joined by the winners of the first round.

```

Leg 1

Match 1:Mechanical VS Chemical

Press s to skip the match for now.
Press any other key to continue.

Enter the number of goals scored by Mechanical:1
Enter the number of goals scored by Chemical:0

Match 2:Civil E/F VS Computer C/D

Press s to skip the match for now.
Press any other key to continue.

Enter the number of goals scored by Civil E/F:2
Enter the number of goals scored by Computer C/D:1

Match 3:Civil G/H VS Civil A/B

Press s to skip the match for now.
Press any other key to continue.

Enter the number of goals scored by Civil G/H:1
Enter the number of goals scored by Civil A/B:1

Match 4:Civil C/D VS Arch

Press s to skip the match for now.
Press any other key to continue.

Enter the number of goals scored by Civil C/D:2
Enter the number of goals scored by Arch:0

```

```

Remaining matches:

Data has been saved!

Press e to end the program.
Press any other key to continue.

Mechanical 1-0 Chemical
Civil E/F 2-1 Computer C/D
Civil G/H 1-1 Civil A/B
Civil C/D 2-0 Arch

```

Let's input all the results of the first leg.

```

Would you like to change any result of the results?

Press Y to change
Press any other key to continue without changing any of the results.

Choose the match number of the match whose outcome you want to change:
Match 1:Mechanical VS Chemical
Match 2:Civil E/F VS Computer C/D
Match 3:Civil G/H VS Civil A/B
Match 4:Civil C/D VS Arch
1
Match 1:Mechanical VS Chemical
Enter number of goals scored by Mechanical:2
Enter number of goals scored by Chemical:0

Mechanical 2-0 Chemical
Civil E/F 2-1 Computer C/D
Civil G/H 1-1 Civil A/B
Civil C/D 2-0 Arch

Would you like to change any result of the results?

Press Y to change
Press any other key to continue without changing any of the results.

The matches have been recorded.
You can check the recorded matches by opening the text file matches.txt.

Press any key to continue.

Data has been saved!

Press e to end the program.
Press any other key to continue

```

At the end of each leg, we can edit the results of the matches.

```

Leg 2

Match 1:Chemical VS Mechanical

Press s to skip the match for now.
Press any other key to continue.

Enter the number of goals scored by Chemical:2
Enter the number of goals scored by Mechanical:1

Match 2:Computer C/D VS Civil E/F

Press s to skip the match for now.
Press any other key to continue.

Enter the number of goals scored by Computer C/D:1
Enter the number of goals scored by Civil E/F:1

Match 3:Civil A/B VS Civil G/H

Press s to skip the match for now.
Press any other key to continue.

Enter the number of goals scored by Civil A/B:1
Enter the number of goals scored by Civil G/H:1

Who won on penalties?
Enter 1 for Civil A/B
Enter 2 for Civil G/H
1

Match 4:Arch VS Civil C/D

Press s to skip the match for now.
Press any other key to continue.

Enter the number of goals scored by Arch:2
Enter the number of goals scored by Civil C/D:0

Who won on penalties?
Enter 1 for Arch
Enter 2 for Civil C/D
2

```

Let's continue with the 2nd leg of the first round.

You might be confused when you see that even though the match between Computer C/D and Civil E/F ended in a draw, the program simply proceeds to the next match. But, it asks the user to input the team that won on penalties when the match between Civil A/B and Civil G/H ends in a draw. Also, the program asks the winner of the penalties between Arch and Civil C/D although Arch won the game 2-0.

This is because only when two teams are tied on aggregate (The net score of the tie over the legs), the program asks the team that won on penalties and advance them forward.

As Civil E/F had beaten Computer C/D in the 1st leg, the sum of the goals scored by teams are 3 and 2 respectively. Hence, there is no need for a tie-breaker in this case. As both the matches between Civil A/B and Civil G/H ended in a draw, penalties were required to determine the winner of the tie. Also, the sum of goals scored by both Arch and Civil C/D is 2 over the two legs, penalties are required to determine the winner.

```
Remaining matches:  
Data has been saved!  
Press e to end the program.  
Press any other key to continue.  
Mechanical 1-2 Chemical  
Civil E/F 1-1 Computer C/D  
Civil A/B 1-1 Civil G/H  
Civil C/D 0-2 Arch  
Would you like to change any result of the results?  
Press Y to change  
Press any other key to continue without changing any of the results.  
The matches have been recorded.  
You can check the recorded matches by opening the text file matches.txt.  
Press any key to continue.  
Data has been saved!  
Press e to end the program.  
Press any other key to continue
```

```
The aggregate scores are:  
Mechanical 3-2 Chemical  
Civil E/F 3-2 Computer C/D  
Civil A/B 2-2 Civil G/H  
Civil C/D 2-2 Arch  
The following teams have advanced to the next round:  
Mechanical  
Civil E/F  
Civil A/B  
Civil C/D
```

After both the legs have been completed, the aggregate scores are displayed and accordingly, the winning teams are advanced to the next round.

Now, let's quickly go through the remaining stages of the tournament. We will use the skip and edit feature in some of the matches of the next rounds. They work in the same ways as in the league tournament we saw earlier.

```
Quarter Finals:  
Electronics VS Civil C/D  
Aerospace VS Civil A/B  
Computer A/B VS Civil E/F  
Electrical VS Mechanical
```

```
Data has been saved!
```

```
Press e to end the program.  
Press any other key to continue.
```

```
Leg 1:
```

```
Match 1: Electronics VS Civil C/D
```

```
Press s to skip the match for now.  
Press any other key to continue.
```

```
Enter the number of goals scored by Electronics:2  
Enter the number of goals scored by Civil C/D:1
```

```
Match 2: Aerospace VS Civil A/B
```

```
Press s to skip the match for now.  
Press any other key to continue.
```

```
Match 3: Computer A/B VS Civil E/F
```

```
Press s to skip the match for now.  
Press any other key to continue.
```

```
Enter the number of goals scored by Computer A/B:1  
Enter the number of goals scored by Civil E/F:1
```

```
Match 4: Electrical VS Mechanical
```

```
Press s to skip the match for now.  
Press any other key to continue.
```

```
Enter the number of goals scored by Electrical:1  
Enter the number of goals scored by Mechanical:2
```

```
Remaining matches:  
Aerospace VS Civil A/B
```

```
Data has been saved!
```

```
Press e to end the program.  
Press any other key to continue.
```

```
Leg 1:
```

```
Match 2: Aerospace VS Civil A/B
```

```
Press s to skip the match for now.  
Press any other key to continue.
```

```
Enter the number of goals scored by Aerospace:1  
Enter the number of goals scored by Civil A/B:1
```

```
Remaining matches:
```

```
Data has been saved!
```

```
Press e to end the program.  
Press any other key to continue.
```

```
Electronics 2-1 Civil C/D  
Aerospace 1-1 Civil A/B  
Computer A/B 1-1 Civil E/F  
Electrical 1-2 Mechanical
```

```
Would you like to change any result of the results?  
Press Y to change the result.  
Press any other key to continue without changing any of the results.
```

```
The matches have been recorded.  
You can check the recorded matches by opening the text file matches.txt.
```

```
Press any key to continue:
```

```
Data has been saved!
```

```
Press e to end the program.  
Press any other key to continue
```

```
Leg 2:  
Match 1:Civil C/D VS Electronics  
Press s to skip the match for now.  
Press any other key to continue.  
Enter the number of goals scored by Civil C/D:1  
Enter the number of goals scored by Electronics:1  
Match 2:Civil A/B VS Aerospace  
Press s to skip the match for now.  
Press any other key to continue.  
Enter the number of goals scored by Civil A/B:2  
Enter the number of goals scored by Aerospace:0  
Match 3:Civil E/F VS Computer A/B  
Press s to skip the match for now.  
Press any other key to continue.  
Enter the number of goals scored by Civil E/F:3  
Enter the number of goals scored by Computer A/B:1  
Match 4:Mechanical VS Electrical  
Press s to skip the match for now.  
Press any other key to continue.  
Enter the number of goals scored by Mechanical:1  
Enter the number of goals scored by Electrical:0  
Remaining matches:  
Data has been saved!  
Press e to end the program.  
Press any other key to continue.
```

```
Electronics 1-1 Civil C/D  
Civil A/B 2-0 Aerospace  
Civil E/F 3-1 Computer A/B  
Mechanical 1-0 Electrical  
Would you like to change any result of the results?  
Press Y to change the result.  
Press any other key to continue without changing any of the results.  
Choose the match number of the match whose outcome you want to change:  
Match 1:Electronics VS Civil C/D  
Match 2:Civil A/B VS Aerospace  
Match 3:Civil E/F VS Computer A/B  
Match 4:Mechanical VS Electrical  
4  
Match 4:Mechanical VS Electrical  
Enter number of goals scored by Mechanical:0  
Enter number of goals scored by Electrical:1  
Who won on penalties?  
Enter 1 for Mechanical  
Enter 2 for Electrical  
2  
Electronics 1-1 Civil C/D  
Civil A/B 2-0 Aerospace  
Civil E/F 3-1 Computer A/B  
Electrical 1-0 Mechanical  
Would you like to change any result of the results?  
Press Y to change the result.  
Press any other key to continue without changing any of the results.  
The matches have been recorded.  
You can check the recorded matches by opening the text file matches.txt.  
Press any key to continue:  
Data has been saved!  
Press e to end the program.  
Press any other key to continue
```

```
The aggregate scores are:  
Electronics 3-2 Civil C/D  
Civil A/B 3-1 Aerospace  
Civil E/F 4-2 Computer A/B  
Electrical 2-2 Mechanical  
The following teams have advanced to the next round:  
Electronics  
Civil A/B  
Civil E/F  
Electrical
```

```
Leg 1:  
Match 1:Electronics VS Electrical  
Press s to skip the match for now.  
Press any other key to continue.  
Enter the number of goals scored by Electronics:1  
Enter the number of goals scored by Electrical:0  
Match 2:Civil A/B VS Civil E/F  
Press s to skip the match for now.  
Press any other key to continue.  
Enter the number of goals scored by Civil A/B:2  
Enter the number of goals scored by Civil E/F:1  
Remaining matches:  
Data has been saved!  
Press e to end the program.  
Press any other key to continue.  
Electronics 1-0 Electrical  
Civil A/B 2-1 Civil E/F  
Would you like to change any result of the results?  
Press Y to change the result.  
Press any other key to continue without changing any of the results.  
The matches have been recorded.  
You can check the recorded matches by opening the text file matches.txt.  
Press any key to continue:  
Data has been saved!  
Press e to end the program.  
Press any other key to continue
```

```
Leg 2:  
Match 1:Electrical VS Electronics  
Press s to skip the match for now.  
Press any other key to continue.  
Enter the number of goals scored by Electrical:1  
Enter the number of goals scored by Electronics:1  
Match 2:Civil E/F VS Civil A/B  
Press s to skip the match for now.  
Press any other key to continue.  
Enter the number of goals scored by Civil E/F:1  
Enter the number of goals scored by Civil A/B:1  
Remaining matches:  
Data has been saved!  
Press e to end the program.  
Press any other key to continue.  
Electronics 1-1 Electrical  
Civil A/B 1-1 Civil E/F  
Would you like to change any result of the results?  
Press Y to change the result.  
Press any other key to continue without changing any of the results.  
The matches have been recorded.  
You can check the recorded matches by opening the text file matches.txt.  
Press any key to continue:  
Data has been saved!  
Press e to end the program.  
Press any other key to continue
```

```
The aggregate scores are:  
Electronics 2-1 Electrical  
Civil A/B 3-2 Civil E/F  
The following teams have advanced to the next round:  
Electronics  
Civil A/B
```

```
Final:  
Electronics VS Civil A/B
```

```
Data has been saved!
```

```
Press e to end the program.  
Press any other key to continue.
```

```
Leg 1:
```

```
Match 1: Electronics VS Civil A/B
```

```
Press s to skip the match for now.  
Press any other key to continue.
```

```
Enter the number of goals scored by Electronics:1  
Enter the number of goals scored by Civil A/B:2
```

```
Remaining matches:
```

```
Data has been saved!
```

```
Press e to end the program.  
Press any other key to continue.
```

```
Civil A/B 2-1 Electronics
```

```
Would you like to change any result of the results?  
Press Y to change the result.  
Press any other key to continue without changing any of the results.
```

```
The matches have been recorded.  
You can check the recorded matches by opening the text file matches.txt.
```

```
Press any key to continue:
```

```
Data has been saved!
```

```
Press e to end the program.  
Press any other key to continue
```

```
The aggregate scores are:  
Civil A/B 2-1 Electronics
```

```
Congratulations Civil A/B! You have won the Pulchowk Cup.
```

```
          @      @  
          @ #####@ @  
          @ #### @  
          @ #### @  
          @ #####@  
          ###  
          #  
          #  
          ##  
          ##
```

```
Press any key to end the program.
```

After the completion of the final, the winner is announced and the trophy is displayed in the console.

matches - Notepad
File Edit Format View Help

Round 1:

Leg 1:
Mechanical 2-0 Chemical
Civil E/F 2-1 Computer C/D
Civil G/H 1-1 Civil A/B
Civil C/D 2-0 Arch

Leg 2:
Mechanical 1-2 Chemical
Civil E/F 1-1 Computer C/D
Civil A/B 1-1 Civil G/H
Civil C/D 0-2 Arch

The aggregate scores are:
Mechanical 3-2 Chemical
Civil E/F 3-2 Computer C/D
Civil A/B 2-2 Civil G/H
Civil C/D 2-2 Arch

Leg 1:
Electronics 2-1 Civil C/D
Aerospace 1-1 Civil A/B
Computer A/B 1-1 Civil E/F
Electrical 1-2 Mechanical

Leg 2:
Electronics 1-1 Civil C/D
Civil A/B 2-0 Aerospace
Civil E/F 3-1 Computer A/B
Electrical 1-0 Mechanical

The aggregate scores are:
Electronics 3-2 Civil C/D
Civil A/B 3-1 Aerospace
Civil E/F 4-2 Computer A/B

matches - Notepad
File Edit Format View Help

Round 1:

Leg 1:
Mechanical 2-0 Chemical
Civil E/F 2-1 Computer C/D
Civil G/H 1-1 Civil A/B
Civil C/D 2-0 Arch

Leg 2:
Mechanical 1-2 Chemical
Civil E/F 1-1 Computer C/D
Civil A/B 1-1 Civil G/H
Civil C/D 0-2 Arch

Quarter Finals:

The aggregate scores are:
Mechanical 3-2 Chemical
Civil E/F 3-2 Computer C/D
Civil A/B 2-2 Civil G/H
Civil C/D 2-2 Arch

Leg 1:
Electronics 2-1 Civil C/D
Aerospace 1-1 Civil A/B
Computer A/B 1-1 Civil E/F
Electrical 1-2 Mechanical

Leg 2:
Electronics 1-1 Civil C/D
Civil A/B 2-0 Aerospace
Civil E/F 3-1 Computer A/B
Electrical 1-0 Mechanical

The aggregate scores are:
Electronics 3-2 Civil C/D
Civil A/B 3-1 Aerospace
Civil E/F 4-2 Computer A/B
Electrical 2-2 Mechanical

Semi Finals:

Leg 1:
Electronics 1-0 Electrical
Civil A/B 2-1 Civil E/F

Leg 2:
Electronics 1-1 Electrical
Civil A/B 1-1 Civil E/F

The aggregate scores are:
Electronics 2-1 Electrical
Civil A/B 3-2 Civil E/F

Final:

Leg 1:
Civil A/B 2-1 Electronics

The aggregate scores are:
Civil A/B 2-1 Electronics

We can see that all of the matches of the tournament have been recorded.

Round Robin and Knockout

Enter the name of the tournament:

Euro 2024

Enter the number of teams:

24

Choose the format of tournament:

- 1) League
- 2) Knockout
- 3) Round Robin and Knockout
- 3

Now, let's start a round robin and knockout tournament which is a mix of the previous two formats. To illustrate this, we are going to simulate the euro cup.

Enter the number of teams per group:

4

How many times do the teams play each other?

1

How many times do the teams play each other in the knockout stages?

1

How many times do they play each other in the final?

1

Now, we can choose the number of teams that are to be placed in a group. We can also choose how many times teams play against each other in the different phases of the tournament.

```
Enter the name of Team1:Germany
Enter the name of Team2:Belgium
Enter the name of Team3:France
Enter the name of Team4:England
Enter the name of Team5:Italy
Enter the name of Team6:Spain
Enter the name of Team7:Portugal
Enter the name of Team8:Denmark
Enter the name of Team9:Netherlands
Enter the name of Team10:Switzerland
Enter the name of Team11:Sweden
Enter the name of Team12:Croatia
Enter the name of Team13:Wales
Enter the name of Team14:Austria
Enter the name of Team15:Ukraine
Enter the name of Team16:Poland
Enter the name of Team17:Serbia
Enter the name of Team18:Czech Republic
Enter the name of Team19:Hungary
Enter the name of Team20:Slovakia
Enter the name of Team21:Turkey
Enter the name of Team22:Russia
Enter the name of Team23:Norway
Enter the name of Team24:Romania
```

Now, we can enter the names of the participating teams. Here, let us take 24 European teams having good chance of making it to the next Euros.

```
Would you like to randomize the order of the teams?
Press Y to randomize.
Press any other key to continue without randomizing.
Choose:
1.All the teams will be randomized.
2.All the teams apart from the host will be randomized.
(The first team you had entered is regarded as the host.)
2
```

We can randomize the order of the teams. If we do not choose to randomize, then the teams will be placed in the groups according to the order their names have been entered. For example:- The first four teams entered will be placed in the first group and so on.

We also have the option to randomize all teams apart from the host country. The first teams whose name was entered will be considered as the host team and they will be placed in the first position of the first group.

As Germany will be hosting the Euros in 2024, their name has been entered first and we will choose the option to randomize all teams apart from the host Germany.

```

Group 1:           Group 2:           Group 3:           Group 4:           Group 5:           Group 6:
Germany          Norway            Belgium          Wales             Romania          Austria
Denmark          Netherlands        Russia           England          Slovakia          Portugal
Poland           Czech Republic     Italy            Croatia          Hungary          Turkey
Switzerland      Spain             Serbia          France           Sweden           Ukraine

The groups have been recorded.
You can check the groups by opening the text file groups.txt.

How many teams from each group will advance to the next round?
2
Choose:
1)12 teams will qualify for the next round and some of the best placed teams will receive bye to the round after that.
2)4 next best placed teams out of 6 groups will qualify for the next round along with the best 2 teams of their groups
and all the teams will take part in the 1st knockout round.
2

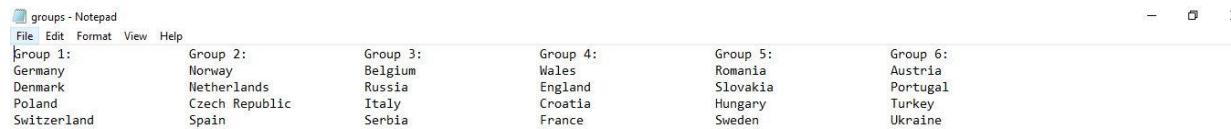
Data has been saved.

Press e to end the program.
Press any other key to continue.

```

We can see that all teams apart from Germany have had their places while group separation. We can now choose how many teams will qualify for the next round.

As 2 teams per group equals 12 teams, we have two options to maintain the knockout format of the tournament to run it smoothly. The bye option has already been demonstrated in the knockout tournament. Let us choose the 2nd option which is exactly what happens in the Euro Cup. 4 best 3rd placed teams will join the 12 teams resulting in 16 teams in the knockout. All of the 16 teams will have to play in the next round and no team receives byes to any rounds.



We can see that the groups have been recorded in the text file.

```
Data has been saved!  
Matchday 1:  
Group 1:  
Germany VS Switzerland  
Denmark VS Poland  
Group 2:  
Norway VS Spain  
Netherlands VS Czech Republic  
Group 3:  
Belgium VS Serbia  
Russia VS Italy  
Group 4:  
Wales VS France  
England VS Croatia  
Group 5:  
Romania VS Sweden  
Slovakia VS Hungary  
Group 6:  
Austria VS Ukraine  
Portugal VS Turkey  
Press e to end the program.  
Press any other key to continue.
```

All the matches of all the groups are displayed.

```
Group 1:  
Match 1:Germany VS Switzerland  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Germany:2  
Enter number of goals scored by Switzerland:1  
  
Match 2:Denmark VS Poland  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Denmark:2  
Enter number of goals scored by Poland:0  
  
Group 2:  
Match 1:Norway VS Spain  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Norway:1  
Enter number of goals scored by Spain:2  
  
Match 2:Netherlands VS Czech Republic  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Netherlands:2  
Enter number of goals scored by Czech Republic:1
```

```
Group 3:  
Match 1:Belgium VS Serbia  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Match 2:Russia VS Italy  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Russia:1  
Enter number of goals scored by Italy:3  
  
Group 4:  
Match 1:Wales VS France  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Wales:1  
Enter number of goals scored by France:2  
  
Match 2:England VS Croatia  
  
Press s to skip the match for now.  
Press any other key to continue.
```

```
Group 5:  
Match 1:Romania VS Sweden  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Romania:1  
Enter number of goals scored by Sweden:2  
  
Match 2:Slovakia VS Hungary  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Slovakia:0  
Enter number of goals scored by Hungary:1  
  
Group 6:  
Match 1:Austria VS Ukraine  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Austria:0  
Enter number of goals scored by Ukraine:1  
  
Match 2:Portugal VS Turkey  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Portugal:2  
Enter number of goals scored by Turkey:0
```

Let us input the results of the matches. 2 games have been skipped which we can access later.

```
Remaining matches:  
Group 1:  
Group 2:  
Group 3:  
Belgium VS Serbia  
Group 4:  
England VS Croatia  
Group 5:  
Group 6:  
Data has been saved!  
Press e to end the program.  
Press any other key to continue.
```

The remaining matches are displayed. Let's end the program and continue it later.

```
Matchday 1:  
Group 1:  
Germany VS Switzerland  
Denmark VS Poland  
Group 2:  
Norway VS Spain  
Netherlands VS Czech Republic  
Group 3:  
Belgium VS Serbia  
Russia VS Italy  
Group 4:  
Wales VS France  
England VS Croatia  
Group 5:  
Romania VS Sweden  
Slovakia VS Hungary  
Group 6:  
Austria VS Ukraine  
Portugal VS Turkey  
Press e to end the program.  
Press any other key to continue.
```

When we open the program and load the tournament, all the fixtures of the running matchday are displayed first.

```
Group 1:  
Group 2:  
Group 3:  
Match 1:Belgium VS Serbia  
Press s to skip the match for now.  
Press any other key to continue.  
Enter number of goals scored by Belgium:2  
Enter number of goals scored by Serbia:0  
Group 4:  
Match 2:England VS Croatia  
Press s to skip the match for now.  
Press any other key to continue.  
Enter number of goals scored by England:1  
Enter number of goals scored by Croatia:0
```

Now, let's input the result of the remaining matches.

```
Remaining matches:  
Group 1:  
Group 2:  
Group 3:  
Group 4:  
Group 5:  
Group 6:  
Data has been saved!  
Press e to end the program.  
Press any other key to continue.
```

Now, there are no matches remaining in matchday 1.

```
Group 1:  
Germany 2-1 Switzerland  
Denmark 2-0 Poland  
Group 2:  
Norway 1-2 Spain  
Netherlands 2-1 Czech Republic  
Group 3:  
Belgium 2-0 Serbia  
Russia 1-3 Italy  
Group 4:  
Wales 1-2 France  
England 1-0 Croatia  
Group 5:  
Romania 1-2 Sweden  
Slovakia 0-1 Hungary  
Group 6:  
Austria 0-1 Ukraine  
Portugal 2-0 Turkey  
Would you like to change any result of Matchday 1?  
Press Y to change the result.  
Press any other key to continue without editing
```

We can edit the matches now.

```
Choose the group number and then the match number of the match whose outcome you want to change:  
Group 1:  
Match 1:Germany VS Switzerland  
Match 2:Denmark VS Poland  
Group 2:  
Match 1:Norway VS Spain  
Match 2:Netherlands VS Czech Republic  
Group 3:  
Match 1:Belgium VS Serbia  
Match 2:Russia VS Italy  
Group 4:  
Match 1:Wales VS France  
Match 2:England VS Croatia  
Group 5:  
Match 1:Romania VS Sweden  
Match 2:Slovakia VS Hungary  
Group 6:  
Match 1:Austria VS Ukraine  
Match 2:Portugal VS Turkey  
Group:3  
Match:2  
Group 3:  
Match 2:Russia VS Italy  
Enter number of goals scored by Russia:0  
Enter number of goals scored by Italy:3
```

To edit the outcome of a match, we have to choose the group number and match number.

```
Group 1:  
Germany 2-1 Switzerland  
Denmark 2-0 Poland  
Group 2:  
Norway 1-2 Spain  
Netherlands 2-1 Czech Republic  
Group 3:  
Belgium 2-0 Serbia  
Russia 0-3 Italy  
Group 4:  
Wales 1-2 France  
England 1-0 Croatia  
Group 5:  
Romania 1-2 Sweden  
Slovakia 0-1 Hungary  
Group 6:  
Austria 0-1 Ukraine  
Portugal 2-0 Turkey  
  
Would you like to change any result of Matchday 1?  
  
Press Y to change the result.  
Press any other key to continue without editing  
  
The matches have been recorded.  
You can check the recorded matches by opening the text file matches.txt:  
  
Press any key to continue.
```

All the matches of matchday 1 have been recorded.

```
The standings at the end of matchday 1 is as follows:
```

```
Group 1:
```

#	Team	Played	GS	GA	GD	Points
1	Denmark	1	2	0	+2	3
2	Germany	1	2	1	+1	3
3	Switzerland	1	1	2	-1	0
4	Poland	1	0	2	-2	0

```
Group 2:
```

#	Team	Played	GS	GA	GD	Points
1	Netherlands	1	2	1	+1	3
2	Spain	1	2	1	+1	3
3	Czech Republic	1	1	2	-1	0
4	Norway	1	1	2	-1	0

```
Group 3:
```

#	Team	Played	GS	GA	GD	Points
1	Italy	1	3	0	+3	3
2	Belgium	1	2	0	+2	3
3	Serbia	1	0	2	-2	0
4	Russia	1	0	3	-3	0

```
Group 4:
```

#	Team	Played	GS	GA	GD	Points
1	France	1	2	1	+1	3
2	England	1	1	0	+1	3
3	Wales	1	1	2	-1	0
4	Croatia	1	0	1	-1	0

```
Group 5:
```

#	Team	Played	GS	GA	GD	Points
1	Sweden	1	2	1	+1	3
2	Hungary	1	1	0	+1	3
3	Romania	1	1	2	-1	0
4	Slovakia	1	0	1	-1	0

```
Group 6:
```

#	Team	Played	GS	GA	GD	Points
1	Portugal	1	2	0	+2	3
2	Ukraine	1	1	0	+1	3
3	Austria	1	0	1	-1	0
4	Turkey	1	0	2	-2	0

```
Standings have been recorded.
```

```
You can check the text file standings.txt for checking the standings at the end of matchdays at any time.
```

```
Data has been saved!
```

The standings of all of the groups are displayed. We can view the mat any time by opening the text file.

Now let's quickly go through the remaining matches of the group stage.

```
Matchday 2:  
Group 1:  
Denmark VS Switzerland  
Poland VS Germany  
  
Group 2:  
Netherlands VS Spain  
Czech Republic VS Norway  
  
Group 3:  
Russia VS Serbia  
Italy VS Belgium  
  
Group 4:  
England VS France  
Croatia VS Wales  
  
Group 5:  
Slovakia VS Sweden  
Hungary VS Romania  
  
Group 6:  
Portugal VS Ukraine  
Turkey VS Austria  
  
Press e to end the program.  
Press any other key to continue.
```

```
Group 1:  
Match 1:Denmark VS Switzerland  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Denmark:1  
Enter number of goals scored by Switzerland:0  
  
Match 2:Poland VS Germany  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Poland:0  
Enter number of goals scored by Germany:2  
  
Group 2:  
  
Match 1:Netherlands VS Spain  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Netherlands:1  
Enter number of goals scored by Spain:1  
  
Match 2:Czech Republic VS Norway  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Czech Republic:2  
Enter number of goals scored by Norway:1
```

```
Group 3:  
Match 1:Russia VS Serbia  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Russia:1  
Enter number of goals scored by Serbia:0  
  
Match 2:Italy VS Belgium  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Italy:2  
Enter number of goals scored by Belgium:1  
  
Group 4:  
  
Match 1:England VS France  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by England:1  
Enter number of goals scored by France:1  
  
Match 2:Croatia VS Wales  
  
Press s to skip the match for now.  
Press any other key to continue.  
  
Enter number of goals scored by Croatia:1  
Enter number of goals scored by Wales:1
```

```
Group 5:  
Match 1:Slovakia VS Sweden  
Press s to skip the match for now.  
Press any other key to continue.  
Enter number of goals scored by Slovakia:0  
Enter number of goals scored by Sweden:2  
Match 2:Hungary VS Romania  
Press s to skip the match for now.  
Press any other key to continue.  
Enter number of goals scored by Hungary:3  
Enter number of goals scored by Romania:1  
Group 6:  
Match 1:Portugal VS Ukraine  
Press s to skip the match for now.  
Press any other key to continue.  
Enter number of goals scored by Portugal:2  
Enter number of goals scored by Ukraine:2  
Match 2:Turkey VS Austria  
Press s to skip the match for now.  
Press any other key to continue.  
Enter number of goals scored by Turkey:2  
Enter number of goals scored by Austria:1
```

```
Remaining matches:  
Group 1:  
Group 2:  
Group 3:  
Group 4:  
Group 5:  
Group 6:  
Data has been saved!  
Press e to end the program.  
Press any other key to continue.
```

```
Group 1:  
Denmark 1-0 Switzerland  
Poland 0-2 Germany  
Group 2:  
Netherlands 1-1 Spain  
Czech Republic 2-1 Norway  
Group 3:  
Russia 1-0 Serbia  
Italy 2-1 Belgium  
Group 4:  
England 1-1 France  
Croatia 1-1 Wales  
Group 5:  
Slovakia 0-2 Sweden  
Hungary 3-1 Romania  
Group 6:  
Portugal 2-2 Ukraine  
Turkey 2-1 Austria  
Would you like to change any result of Matchday 2?  
Press Y to change the result.  
Press any other key to continue without editing  
The matches have been recorded.  
You can check the recorded matches by opening the text file matches.txt.  
Press any key to continue.
```

```

The standings at the end of matchday 2 is as follows:
Group 1:
#   Team          Played GS  GA  GD  Points
1  Germany        2    4   1   +3   6
2  Denmark        2    3   0   +3   6
3  Switzerland    2    1   3   -2   0
4  Poland         2    0   4   -4   0
Group 2:
#   Team          Played GS  GA  GD  Points
1  Netherlands    2    3   2   +1   4
2  Spain          2    3   2   +1   4
3  Czech Republic 2    3   3   0   3
4  Norway         2    2   4   -2   0
Group 3:
#   Team          Played GS  GA  GD  Points
1  Italy          2    5   1   +4   6
2  Belgium        2    3   2   +1   3
3  Russia         2    1   3   -2   3
4  Serbia          2    0   3   -3   0
Group 4:
#   Team          Played GS  GA  GD  Points
1  France         2    3   2   +1   4
2  England        2    2   1   +1   4
3  Wales           2    2   3   -1   1
4  Croatia        2    1   2   -1   1
Group 5:
#   Team          Played GS  GA  GD  Points
1  Hungary        2    4   1   +3   6
2  Sweden          2    4   1   +3   6
3  Romania         2    2   5   -3   0
4  Slovakia        2    0   3   -3   0
Group 6:
#   Team          Played GS  GA  GD  Points
1  Portugal        2    4   2   +2   4
2  Ukraine         2    3   2   +1   4
3  Turkey          2    2   3   -1   3
4  Austria          2    1   3   -2   0

Standings have been recorded.
You can check the text file standings.txt for checking the standings at the end of matchdays at any time.

Data has been saved!

```

```

Matchday 3:

Group 1:
Poland VS Switzerland
Germany VS Denmark

Group 2:
Czech Republic VS Spain
Norway VS Netherlands

Group 3:
Italy VS Serbia
Belgium VS Russia

Group 4:
Croatia VS France
Wales VS England

Group 5:
Hungary VS Sweden
Romania VS Slovakia

Group 6:
Turkey VS Ukraine
Austria VS Portugal

Press e to end the program.
Press any other key to continue.

```

```

Group 1:
Match 1:Poland VS Switzerland
Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Poland:1
Enter number of goals scored by Switzerland:1

Match 2:Germany VS Denmark
Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Germany:2
Enter number of goals scored by Denmark:2

Group 2:
Match 1:Czech Republic VS Spain
Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Czech Republic:1
Enter number of goals scored by Spain:1

Match 2:Norway VS Netherlands
Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Norway:0
Enter number of goals scored by Netherlands:2

```

Group 3:

Match 1:Italy VS Serbia

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Italy:2
Enter number of goals scored by Serbia:0

Match 2:Belgium VS Russia

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Belgium:3
Enter number of goals scored by Russia:0

Group 4:

Match 1:Croatia VS France

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Croatia:1
Enter number of goals scored by France:2

Match 2:Wales VS England

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Wales:1
Enter number of goals scored by England:2

Group 5:

Match 1:Hungary VS Sweden

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Hungary:1
Enter number of goals scored by Sweden:1

Match 2:Romania VS Slovakia

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Romania:1
Enter number of goals scored by Slovakia:1

Group 6:

Match 1:Turkey VS Ukraine

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Turkey:1
Enter number of goals scored by Ukraine:2

Match 2:Austria VS Portugal

Press s to skip the match for now.
Press any other key to continue.

Enter number of goals scored by Austria:0
Enter number of goals scored by Portugal:1

Remaining matches:

Group 1:

Group 2:

Group 3:

Group 4:

Group 5:

Group 6:

Data has been saved!

Press s to end the program.
Press any other key to continue.

```

Group 1:
Poland 1-1 Switzerland
Germany 2-2 Denmark
Group 2:
Czech Republic 1-1 Spain
Norway 0-2 Netherlands
Group 3:
Italy 2-0 Serbia
Belgium 3-0 Russia
Group 4:
Croatia 1-2 France
Wales 1-2 England
Group 5:
Hungary 1-1 Sweden
Romania 1-1 Slovakia
Group 6:
Turkey 1-2 Ukraine
Austria 0-1 Portugal

```

Would you like to change any result of Matchday 3?

Press Y to change the result.

Press any other key to continue without editing

The matches have been recorded.

You can check the recorded matches by opening the text file matches.txt.

Press any key to continue.

The standings at the end of matchday 3 is as follows:

Group 1:

#	Team	Played	GS	GA	GD	Points
1	Germany	3	6	3	+3	7
2	Denmark	3	5	2	+3	7
3	Switzerland	3	2	4	-2	1
4	Poland	3	1	5	-4	1

Group 2:

#	Team	Played	GS	GA	GD	Points
1	Netherlands	3	5	2	+3	7
2	Spain	3	4	3	+1	5
3	Czech Republic	3	4	4	0	4
4	Norway	3	2	6	-4	0

Group 3:

#	Team	Played	GS	GA	GD	Points
1	Italy	3	7	1	+6	9
2	Belgium	3	6	2	+4	6
3	Russia	3	1	6	-5	3
4	Serbia	3	0	5	-5	0

Group 4:

#	Team	Played	GS	GA	GD	Points
1	France	3	5	3	+2	7
2	England	3	4	2	+2	7
3	Wales	3	3	5	-2	1
4	Croatia	3	2	4	-2	1

Group 5:

#	Team	Played	GS	GA	GD	Points
1	Hungary	3	5	2	+3	7
2	Sweden	3	5	2	+3	7
3	Romania	3	3	6	-3	1
4	Slovakia	3	1	4	-3	1

Group 6:

#	Team	Played	GS	GA	GD	Points
1	Portugal	3	5	2	+3	7
2	Ukraine	3	5	3	+2	7
3	Turkey	3	3	5	-2	3
4	Austria	3	1	4	-3	0

Standings have been recorded.

You can check the text file standings.txt for checking the standings at the end of matchdays at any time.

Ranking of the next best teams:

#	Team	Played	GS	GA	GD	Points
1	Czech Republic	3	4	4	0	4
2	Turkey	3	3	5	-2	3
3	Russia	3	1	6	-5	3
4	Wales	3	3	5	-2	1
5	Switzerland	3	2	4	-2	1
6	Romania	3	3	6	-3	1

The ranking of the next best placed teams have been recorded.

You can see the ranking by opening the file standings.txt.

At the end of the group stages, the best 3rd teams are ranked.

```
The following teams have advanced to the next round:  
Group 1:  
Germany  
Denmark  
Group 2:  
Netherlands  
Spain  
Group 3:  
Italy  
Belgium  
Group 4:  
France  
England  
Group 5:  
Hungary  
Sweden  
Group 6:  
Portugal  
Ukraine  
  
The following teams have advanced to the next round as the next best teams:  
Czech Republic  
Turkey  
Russia  
Wales  
  
Data has been saved!  
  
Press e to end the program.  
Press any other key to continue
```

The top 2 teams of each group and the 4 best 3rd placed teams advanced to the next round.

```
Round 2:  
Portugal VS Czech Republic  
Hungary VS Wales  
France VS Russia  
Netherlands VS Turkey  
Germany VS England  
Italy VS Denmark  
Belgium VS Sweden  
Ukraine VS Spain  
  
Press Y to redraw the matches.  
Press any other key to continue without redrawing.  
  
Data has been saved!  
  
Press e to end the program.  
Press any other key to continue.
```

Now, the knockout stages begin!

```
Leg 1:  
Match 1:Portugal VS Czech Republic  
  
Press s to skip the match for now  
Press any other key to continue:  
  
Enter the number of goals scored by Portugal:2  
Enter the number of goals scored by Czech Republic:1  
  
Match 2:Hungary VS Wales  
  
Press s to skip the match for now  
Press any other key to continue:  
  
Enter the number of goals scored by Hungary:1  
Enter the number of goals scored by Wales:1  
Who won on penalties?  
Enter 1 for Hungary  
Enter 2 for Wales  
1  
  
Match 3:France VS Russia  
  
Press s to skip the match for now  
Press any other key to continue:  
  
Enter the number of goals scored by France:3  
Enter the number of goals scored by Russia:1  
  
Match 4:Netherlands VS Turkey  
  
Press s to skip the match for now  
Press any other key to continue:  
  
Enter the number of goals scored by Netherlands:2  
Enter the number of goals scored by Turkey:0
```

```
Match 5:Germany VS England  
  
Press s to skip the match for now  
Press any other key to continue:  
  
Enter the number of goals scored by Germany:2  
Enter the number of goals scored by England:1  
  
Match 6:Italy VS Denmark  
  
Press s to skip the match for now  
Press any other key to continue:  
  
Enter the number of goals scored by Italy:2  
Enter the number of goals scored by Denmark:1  
  
Match 7:Belgium VS Sweden  
  
Press s to skip the match for now  
Press any other key to continue:  
  
Enter the number of goals scored by Belgium:2  
Enter the number of goals scored by Sweden:0  
  
Match 8:Ukraine VS Spain  
  
Press s to skip the match for now  
Press any other key to continue:  
  
Enter the number of goals scored by Ukraine:1  
Enter the number of goals scored by Spain:1  
Who won on penalties?  
Enter 1 for Ukraine  
Enter 2 for Spain  
2
```

As we chose that the teams would only play each other once, a match that ends in a draw immediately has to be decided by a tie-breaker. Here, we can see all the matches ending in a draw being decided by penalties.

```
Remaining matches:  
Data has been saved!  
Press e to end the program.  
Press any other key to continue.  
Portugal 2-1 Czech Republic  
Hungary 1-1 Wales  
France 3-1 Russia  
Netherlands 2-0 Turkey  
Germany 2-1 England  
Italy 2-1 Denmark  
Belgium 2-0 Sweden  
Spain 1-1 Ukraine  
Would you like to change any result of the results?  
Press Y to change.  
Press any other key to continue without editing.  
The matches have been recorded.  
You can check the recorded matches by opening the text file matches.txt.  
Press any key to continue.  
Data has been saved!  
Press e to end the program.  
Press any other key to continue.
```

```
The aggregate scores are:  
Portugal 2-1 Czech Republic  
Hungary 1-1 Wales  
France 3-1 Russia  
Netherlands 2-0 Turkey  
Germany 2-1 England  
Italy 2-1 Denmark  
Belgium 2-0 Sweden  
Spain 1-1 Ukraine  
The following teams have advanced to the next round:  
Portugal  
Hungary  
France  
Netherlands  
Germany  
Italy  
Belgium  
Spain  
Quarter Finals:  
Portugal VS Spain  
Hungary VS Belgium  
France VS Italy  
Netherlands VS Germany  
Data has been saved!  
Press e to end the program.  
Press any other key to continue.
```

In this way the 1st knockout round comes to an end. The winning teams advanced to the quarter finals. Let's quickly run the rest of the tournament.

```
Leg 1:  
Match 1:Portugal VS Spain  
Press s to skip the match for now.  
Press any other key to continue.  
Enter the number of goals scored by Portugal:1  
Enter the number of goals scored by Spain:1  
Who won on penalties?  
Enter 1 for Portugal  
Enter 2 for Spain  
1  
Match 2:Hungary VS Belgium  
Press s to skip the match for now.  
Press any other key to continue.  
Enter the number of goals scored by Hungary:1  
Enter the number of goals scored by Belgium:2  
Match 3:France VS Italy  
Press s to skip the match for now.  
Press any other key to continue.  
Enter the number of goals scored by France:0  
Enter the number of goals scored by Italy:0  
Who won on penalties?  
Enter 1 for France  
Enter 2 for Italy  
1  
Match 4:Netherlands VS Germany  
Press s to skip the match for now.  
Press any other key to continue.  
Enter the number of goals scored by Netherlands:0  
Enter the number of goals scored by Germany:1
```

```
Remaining matches:  
Data has been saved.  
Press e to end the program.  
Press any other key to continue  
Portugal 1-1 Spain  
Belgium 2-1 Hungary  
France 0-0 Italy  
Germany 1-0 Netherlands  
Would you like to change any result of the results?  
Press Y to change the result.  
Press any other key to continue without editing.  
The matches have been recorded.  
You can check the recorded matches by opening the text file matches.txt  
Press any key to continue.  
Data has been saved!  
Press e to end the program.  
Press any other key to continue
```

```
The aggregate scores are:  
Portugal 1-1 Spain  
Belgium 2-1 Hungary  
France 0-0 Italy  
Germany 1-0 Netherlands  
The following teams have advanced to the next round:  
Portugal  
Belgium  
France  
Germany  
Semi Finals:  
Portugal VS Germany  
Belgium VS France  
Data has been saved!  
Press e to end the program.  
Press any other key to continue.
```

```
Leg 1:  
Match 1:Portugal VS Germany  
Press s to skip the match for now.  
Press any other key to continue.  
Enter the number of goals scored by Portugal:1  
Enter the number of goals scored by Germany:1  
Who won on penalties?  
Enter 1 for Portugal  
Enter 2 for Germany  
2  
Match 2:Belgium VS France  
Press s to skip the match for now.  
Press any other key to continue.  
Enter the number of goals scored by Belgium:1  
Enter the number of goals scored by France:2
```

```
Remaining matches:  
Data has been saved.  
Press e to end the program.  
Press any other key to continue.  
Germany 1-1 Portugal  
France 2-1 Belgium  
Would you like to change any result of the results?  
Press Y to change the result.  
Press any other key to continue without editing.  
The matches have been recorded.  
You can check the recorded matches by opening the text file matches.txt  
Press any key to continue.  
Data has been saved!  
Press e to end the program.  
Press any other key to continue
```

```
The aggregate scores are:  
Germany 1-1 Portugal  
France 2-1 Belgium  
The following teams have advanced to the next round:  
Germany  
France  
Final:  
Germany VS France  
Data has been saved!  
Press e to end the program.  
Press any other key to continue.
```

```
Leg 1:  
Match 1:Germany VS France  
Press s to skip the match for now.  
Press any other key to continue.  
Enter the number of goals scored by Germany:0  
Enter the number of goals scored by France:1
```

```

Remaining matches:
Data has been saved.

Press e to end the program.
Press any other key to continue

France 1-0 Germany

Would you like to change any result of the results?

Press Y to change the result.
Press any other key to continue without editing.

The matches have been recorded.
You can check the recorded matches by opening the text file matches.txt

Press any key to continue.

Data has been saved!

Press e to end the program.
Press any other key to continue

```

```

The aggregate scores are:
France 1-0 Germany

```

Congratulations France! You have won the Euro 2024.

```

@   @
@ #####@ @
@ ##### @
@ ##### @
@ #####@

####
# #
###
####

```

Press any key to end the program.

After the completion of the final, the winner is announced and the trophy is displayed in the console.

The standings at the end of matchday 1 is as follows:

Group 1:						
#	Team	Played	GS	GA	GD	Points
1	Denmark	1	2	0	+2	3
2	Germany	1	2	1	+1	3
3	Switzerland	1	1	2	-1	0
4	Poland	1	0	2	-2	0
Group 2:						
#	Team	Played	GS	GA	GD	Points
1	Netherlands	1	2	1	+1	3
2	Spain	1	2	1	+1	3
3	Czech Republic	1	1	2	-1	0
4	Norway	1	1	2	-1	0
Group 3:						
#	Team	Played	GS	GA	GD	Points
1	Italy	1	3	0	+3	3
2	Belgium	1	2	0	+2	3
3	Serbia	1	0	2	-2	0
4	Russia	1	0	3	-3	0
Group 4:						
#	Team	Played	GS	GA	GD	Points
1	France	1	2	1	+1	3
2	England	1	1	0	+1	3
3	Wales	1	1	2	-1	0
4	Croatia	1	0	1	-1	0
Group 5:						
#	Team	Played	GS	GA	GD	Points
1	Sweden	1	2	1	+1	3
2	Hungary	1	1	0	+1	3
3	Romania	1	1	2	-1	0
4	Slovakia	1	0	1	-1	0
Group 6:						
#	Team	Played	GS	GA	GD	Points
1	Portugal	1	2	0	+2	3
2	Ukraine	1	1	0	+1	3
3	Austria	1	0	1	-1	0
4	Turkey	1	0	2	-2	0

The standings at the end of matchday 2 is as follows:

Group 1:

#	Team	Played	GS	GA	GD	Points
1	Germany	2	4	1	+3	6
2	Denmark	2	3	0	+3	6
3	Switzerland	2	1	3	-2	0
4	Poland	2	0	4	-4	0

Group 2:

#	Team	Played	GS	GA	GD	Points
1	Netherlands	2	3	2	+1	4
2	Spain	2	3	2	+1	4
3	Czech Republic	2	3	3	0	3
4	Norway	2	2	4	-2	0

Group 3:

#	Team	Played	GS	GA	GD	Points
1	Italy	2	5	1	+4	6
2	Belgium	2	3	2	+1	3
3	Russia	2	1	3	-2	3
4	Serbia	2	0	3	-3	0

Group 4:

#	Team	Played	GS	GA	GD	Points
1	France	2	3	2	+1	4
2	England	2	2	1	+1	4
3	Wales	2	2	3	-1	1
4	Croatia	2	1	2	-1	1

Group 5:

#	Team	Played	GS	GA	GD	Points
1	Hungary	2	4	1	+3	6
2	Sweden	2	4	1	+3	6
3	Romania	2	2	5	-3	0
4	Slovakia	2	0	3	-3	0

Group 6:

#	Team	Played	GS	GA	GD	Points
1	Portugal	2	4	2	+2	4
2	Ukraine	2	3	2	+1	4
3	Turkey	2	2	3	-1	3
4	Austria	2	1	3	-2	0

The standings at the end of matchday 3 is as follows:

Group 1:

#	Team	Played	GS	GA	GD	Points
1	Germany	3	6	3	+3	7
2	Denmark	3	5	2	+3	7
3	Switzerland	3	2	4	-2	1
4	Poland	3	1	5	-4	1

Group 2:

#	Team	Played	GS	GA	GD	Points
1	Netherlands	3	5	2	+3	7
2	Spain	3	4	3	+1	5
3	Czech Republic	3	4	4	0	4
4	Norway	3	2	6	-4	0

Group 3:

#	Team	Played	GS	GA	GD	Points
1	Italy	3	7	1	+6	9
2	Belgium	3	6	2	+4	6
3	Russia	3	1	6	-5	3
4	Serbia	3	0	5	-5	0

Group 4:

#	Team	Played	GS	GA	GD	Points
1	France	3	5	3	+2	7
2	England	3	4	2	+2	7
3	Wales	3	3	5	-2	1
4	Croatia	3	2	4	-2	1

Group 5:

#	Team	Played	GS	GA	GD	Points
1	Hungary	3	5	2	+3	7
2	Sweden	3	5	2	+3	7
3	Romania	3	3	6	-3	1
4	Slovakia	3	1	4	-3	1

Group 6:

#	Team	Played	GS	GA	GD	Points
1	Portugal	3	5	2	+3	7
2	Ukraine	3	5	3	+2	7
3	Turkey	3	3	5	-2	3
4	Austria	3	1	4	-3	0

Ranking of the next best teams:

#	Team	Played	GS	GA	GD	Points
1	Czech Republic	3	4	4	0	4
2	Turkey	3	3	5	-2	3
3	Russia	3	1	6	-5	3
4	Wales	3	3	5	-2	1
5	Switzerland	3	2	4	-2	1
6	Romania	3	3	6	-3	1

We can see that the standings of all groups at the end of every matchday and the ranking of the 3rd placed teams have been recorded.

matches - Notepad

File Edit Format View Help

Matchday 1:

Group 1:
Germany 2-1 Switzerland
Denmark 2-0 Poland

Group 2:
Norway 1-2 Spain
Netherlands 2-1 Czech Republic

Group 3:
Belgium 2-0 Serbia
Russia 0-3 Italy

Group 4:
Wales 1-2 France
England 1-0 Croatia

Group 5:
Romania 1-2 Sweden
Slovakia 0-1 Hungary

Group 6:
Austria 0-1 Ukraine
Portugal 2-0 Turkey

Matchday 2:

Group 1:
Denmark 1-0 Switzerland
Poland 0-2 Germany

Group 2:
Netherlands 1-1 Spain
Czech Republic 2-1 Norway

Group 3:
Russia 1-0 Serbia
Italy 2-1 Belgium

Group 4:
England 1-1 France
Croatia 1-1 Wales

Group 5:
Slovakia 0-2 Sweden
Hungary 3-1 Romania

Group 6:
Portugal 2-2 Ukraine
Turkey 2-1 Austria

Matchday 3:

Group 1:
Poland 1-1 Switzerland
Germany 2-2 Denmark

Group 2:
Czech Republic 1-1 Spain
Norway 0-2 Netherlands

Group 3:
Italy 2-0 Serbia
Belgium 3-0 Russia

Group 4:
Croatia 1-2 France
Wales 1-2 England

Group 5:
Hungary 1-1 Sweden
Romania 1-1 Slovakia

Group 6:
Turkey 1-2 Ukraine
Austria 0-1 Portugal

Knockout Stage:

Round 2:

Leg 1:
Portugal 2-1 Czech Republic
Hungary 1-1 Wales
France 3-1 Russia
Netherlands 2-0 Turkey
Germany 2-1 England
Italy 2-1 Denmark
Belgium 2-0 Sweden
Spain 1-1 Ukraine

The aggregate scores are:
Portugal 2-1 Czech Republic
Hungary 1-1 Wales
France 3-1 Russia
Netherlands 2-0 Turkey
Germany 2-1 England
Italy 2-1 Denmark
Belgium 2-0 Sweden
Spain 1-1 Ukraine

Quarter Finals:

Leg 1:
Portugal 1-1 Spain
Belgium 2-1 Hungary
France 0-0 Italy
Germany 1-0 Netherlands

The aggregate scores are:
Portugal 1-1 Spain
Belgium 2-1 Hungary
France 0-0 Italy
Germany 1-0 Netherlands

Semi Finals:

Leg 1:
Germany 1-1 Portugal
France 2-1 Belgium

The aggregate scores are:
Germany 1-1 Portugal
France 2-1 Belgium

Final:

Leg 1:
France 1-0 Germany

The aggregate scores are:
France 1-0 Germany

We can see that all the matches of every round have been recorded.

Chapter 06

Conclusions

After proper testing and executing the program, following conclusions can be made:

- This program is capable of organizing any Local Football Tournaments which might be Round-Robin, Knockout, or Hybrid type
- This program has options to customize the given type of tournament in many different ways as required by the organizer.
- The program has an in-built stopwatch which can be used during match time.
- This program saves each and every tournament datas in text files which can be easily accessed.
- This program informs users after the information has been saved and allows users to easily end the program and provides an option to load the tournament from the phase it has ended.
- This program also has an option to edit the input scores if it has been mistaken by the user at the time of entry.

APPENDIX:

Source Code:

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<math.h>
#include<time.h>
#include<windows.h>
void start();
void roundrobin(int,int,char[]);
void knockout(int,int,char[]);
void hybrid(int,int,char[]);
void timer();
void zero(int x ,int y);
void one(int x,int y);
void two(int x,int y);
void three(int x,int y);
void four(int x,int y);
void five(int x,int y);
void six(int x,int y);
void seven(int x,int y);
void eight(int x,int y);
void nine(int x,int y);
void colon(int x,int y);
void gotoxy(int x,int y);
void display(int digit, int x , int y);
void showtime(int minute , int second);
void SetColor(int ForgC);
```

```

void characterC(int x,int y);
void characterU(int x, int y);
void characterS(int x, int y);
void characterT(int x, int y);
void characterO(int x,int y);
void characterM(int x, int y);
void characterF(int x,int y);
void characterB(int x, int y);
void characterA(int x, int y);
void characterL(int x, int y);
void characterR(int x, int y);
void characterN(int x, int y);
void characterE(int x, int y);

struct table
{
    char name[50];
    int p,pts,GS,GA,GD,len,rcheck,g;
};

struct groups
{
    struct table grp[50],temp;
    int teams,check[50];
};

struct general
{
    char name[50];
    int goals,agg,check;
};

struct teams

```

```
{  
    char name[50];  
    int goals,agg,check;  
};  
  
int main()  
{  
    char ch;  
    SetColor(13);  
    characterC(33,1);  
    characterU(41,1);  
    characterS(49,1);  
    characterT(57,1);  
    characterO(65,1);  
    characterM(73,1);  
    SetColor(11);  
    characterF(25,8);  
    characterO(33,8);  
    characterO(41,8);  
    characterT(49,8);  
    characterB(57,8);  
    characterA(65,8);  
    characterL(73,8);  
    characterL(81,8);  
    SetColor(14);  
    characterT(17,15);  
    characterO(25,15);  
    characterU(33,15);  
    characterR(41,15);  
    characterN(49,15);
```

```
characterA(57,15);
characterM(65,15);
characterE(75,15);
characterN(83,15);
characterT(91,15);

SetColor(10);

gotoxy(47,22);

printf("Press any key to continue.\n");

SetColor(15);

gotoxy(59,23);

ch=getch();

system("CLS");

start();

printf("\nPress any key to end the program.\n");

ch=getch();

return 0;

}
```

```
void start()
{
    int format,n,a,t;
    char tnmt[50];
    FILE *tv,*tn;
    app:
    printf("Choose the preferred option:\n");
    SetColor(14);
    printf("1.Organize a Tournament\n");
    SetColor(10);
    printf("2.Use the StopWatch\n");
```

```

SetColor(15);
scanf("%d",&a);
system("CLS");
switch(a)
{
case 1:
{
printf("Enter:");
SetColor(11);
printf("\n1.New Tournament");
SetColor(14);
printf("\n2.Load Tournament\n");
SetColor(12);
printf("\nWarning!!! Starting a new tournament will erase previous tournament.\n");
SetColor(15);
scanf("%d",&t);
system("CLS");
if(t==2)
{
goto load;
}
tv=fopen("tournament variables.txt","wb");
printf("Enter the name of the tournament:\n");
SetColor(11);
scanf(" %[^\n]s ",tnmt);
SetColor(15);
printf("Enter the number of teams:\n");
scanf("%d",&n);
selectformat:

```

```

printf("Choose the format of tournament:\n");

SetColor(14);

printf("1)League\n");

SetColor(12);

printf("2)Knockout\n");

SetColor(11);

printf("3)Round Robin and Knockout\n");

scanf("%d",&format);

system("CLS");

tn=fopen("tournament name.txt","wb");

fprintf(tn,"%s\n",tnmt);

fclose(tn);

fprintf(tv,"%d\n",n);

fprintf(tv,"%d",format);

fclose(tv);

load:

tv=fopen("tournament variables.txt","rb");

tn=fopen("tournament name.txt","rb");

while(!feof(tn))

{

fscanf(tn,"%[^\\n]s",tnmt);

}

while(!feof(tv))

{

fscanf(tv,"%d%d",&n,&format);

}

fclose(tn);

fclose(tv);

switch(format)

```

```
{  
    case 1:  
        roundrobin(n,t,tnmt);  
        break;  
    case 2:  
        knockout(n,t,tnmt);  
        break;  
    case 3:  
        hybrid(n,t,tnmt);  
        break;  
    default:  
    {  
        SetColor(12);  
        printf("Error!!!\n");  
        SetColor(15);  
        goto selectformat;  
    }  
}  
break;  
}  
case 2:  
timer();  
break;  
default:  
{  
    SetColor(12);  
    printf("Error!!!\n");  
    SetColor(15);  
    goto app;
```

```

}

}

}

void roundrobin(int n,int nl,char tnmt[50])
{
    int i,j,k,l,m,o,y,edit,sread=-1,mid;
    FILE *rr,*rv,*stand,*match;
    struct table s[100],t[100],temp;
    char e,random[100];
    srand(time(NULL));
    if(nl==2)
    {
        rv=fopen("round robin variables.txt","rb");
        while(!feof(rv))
        {
            fscanf(rv,"%d%d%d%d",&m,&y,&j,&mid);
        }
        fclose(rv);
        rr=fopen("table.txt","rb");
        while(!feof(rr))
        {
            fread(&s[++sread],sizeof(struct table),1,rr);
        }
        fclose(rr);
        goto load;
    }
    stand=fopen("standings.txt","w");
    fclose(stand);
}

```

```

match=fopen("matches.txt","w");
fclose(match);
rv=fopen("round robin variables.txt","wb");
mid=0;
printf("How many times do the teams play each other?\n");
scanf("%d",&m);
for(i=0;i<n;i++)
{
    s[i].rcheck=1;
}
for(i=0;i<n;i++)
{
    SetColor(i%5+10);
    printf("Enter the name of team %d:",i+1);
    scanf(" %[^\n]s ",s[i].name);
}
SetColor(15);
system("CLS");
printf("Would you like to randomize the order of the teams?\n");
SetColor(14);
printf("Press Y to randomize.\n");
SetColor(13);
printf("Press any key to continue without randomizing.\n");
SetColor(15);
e=getch();
if(e=='Y' | e=='y')
{
    for(i=0;i<n;i++)
    {

```

```

j=(rand()% (n-1))+1;
strcpy(random,s[i].name);
strcpy(s[i].name,s[j].name);
strcpy(s[j].name,random);

}

SetColor(14);

printf("\nRandomized!\n");

}

for(i=0;i<n;i++)

{
    s[i].pts=0;
    s[i].GS=0;
    s[i].GA=0;
    s[i].GD=0;
    s[i].p=0;
    s[i].len=strlen(s[i].name);
}

rr=fopen("table.txt","wb");

for(i=0;i<n;i++)

{
    fwrite(&s[i],sizeof(struct table),1,rr);
}

fclose(rr);

SetColor(10);

printf("\nData has been saved!\n");

j=0;

y=1;

SetColor(12);

printf("\nPress e to end the program.\n");

```

```

SetColor(14);

printf("Press any other key to continue.\n");

e=getch();

SetColor(15);

if(e=='E' || e=='e')

{

fprintf(rv,"%d\n%d\n%d\n%d",m,y,j,mid);

fclose(rv);

exit(0);

}

fclose(rv);

load:

rv=fopen("round robin variables.txt","wb");

for(l=y;l<=m;l++)

{

if(n%2==0)

{

o=(l*n)-l;

}

else

{

o=l*n;

}

while(j<o)

{

rr=fopen("table.txt","wb");

for(i=0;i<n;i++)

{

fwrite(&s[i],sizeof(struct table),1,rr);

```

```

}

fclose(rr);

SetColor(10);

printf("\nData has been saved!\n");

SetColor(15);

if(l%2==0 && mid!=1)

{

if(n%2==0)

{

for(i=0;i<n/2;i++)

{

temp=s[i];

s[i]=s[n-1-i];

s[n-1-i]=temp;

}

}

else

{

for(i=0;i<n/2;i++)

{

temp=s[i+1];

s[i+1]=s[n-1-i];

s[n-1-i]=temp;

}

}

}

mid=0;

SetColor(10);

printf("\nMatchday %d:\n",j+1);

```

```

SetColor(15);

for(i=0;i<n/2;i++)
{
    if(n%2==0)
        printf("%s VS %s\n",s[i].name,s[n-1-i].name);
    else
        printf("%s VS %s\n",s[i+1].name,s[n-1-i].name);
}

SetColor(12);

printf("\nPress e to end the program.");

SetColor(14);

printf("\nPress any other key to continue.\n");

SetColor(15);

e=getch();

if(e=='E' | | e=='e')
{
    y=l;

fprintf(rv,"%d\n %d\n %d\n%d",m,y,j,mid);

fclose(rv);

exit(0);

}

skippeda:

if(n%2==0)
{
    for(i=0;i<n/2;i++)
    {
        if(s[i].rcheck==1)

        printf("\n");
    }
}

```

```

printf("Match %d:%s VS %s\n",i+1,s[i].name,s[n-1-i].name);
SetColor(12);

printf("\nPress s to skip the match for now.\n");
SetColor(14);

printf("Press any other key to continue.\n");
SetColor(15);

e=getch();

if(e!='S'&&e!='s')
{
    s[i].rcheck=0;
    printf("\nEnter number of goals scored by %s:",s[i].name);
    scanf("%d",&s[i].g);
    printf("Enter number of goals scored by %s:",s[n-1-i].name);
    scanf("%d",&s[n-1-i].g);
}
}

}

}

else
{
for(i=0;i<n/2;i++)
{
    if(s[i+1].rcheck==1)
    {
        printf("\n");
        printf("Match %d:%s VS %s\n",i+1,s[i+1].name,s[n-1-i].name);
        SetColor(12);

        printf("\nPress s to skip the match for now.\n");
        SetColor(14);
}

```

```

printf("Press any other key to continue.\n");

SetColor(15);

e=getch();

if(e!='S'&&e!='s')

{

s[i+1].rcheck=0;

printf("\nEnter number of goals scored by %s:",s[i+1].name);

scanf("%d",&s[i+1].g);

printf("Enter number of goals scored by %s:",s[n-1-i].name);

scanf("%d",&s[n-1-i].g);

}

}

}

SetColor(11);

printf("\nRemaining matches:\n");

SetColor(15);

if(n%2==0)

{

for(i=0;i<n/2;i++)

{

if(s[i].rcheck==1)

{

printf("%s VS %s\n",s[i].name,s[n-1-i].name);

}

}

}

else

{

```

```

for(i=0;i<n/2;i++)
{
    if(s[i+1].rcheck==1)
    {
        printf("%s VS %s\n",s[i+1].name,s[n-1-i].name);
    }
}
}

rr=fopen("table.txt","wb");
for(i=0;i<n;i++)
{
    fwrite(&s[i],sizeof(struct table),1,rr);
}
fclose(rr);

SetColor(10);

printf("\nData has been saved!\n");

SetColor(12);

printf("\nPress e to end the program.\n");

SetColor(14);

printf("Press any other key to continue\n");

SetColor(15);

e=getch();

if(e=='E' | | e=='e')
{
    y=l;
    mid=1;
    fprintf(rv,"%d\n %d\n %d\n %d",m,y,j,mid);
    fclose(rv);
    exit(0);
}

```

```

}

if(n%2==0)

{
for(i=0;i<n/2;i++)

{
if(s[i].rcheck==1)

goto skipeda;

}

}

else

{

for(i=0;i<n/2;i++)

{
if(s[i+1].rcheck==1)

goto skipeda;

}

}

for(i=0;i<n;i++)

{
s[i].rcheck=1;

}

printf("\n");

editresult1a:

printf("\n");

for(i=0;i<n/2;i++)

{
if(n%2==0)

printf("%s %d-%d %s\n",s[i].name,s[i].g,s[n-1-i].g,s[n-1-i].name);

else

```

```

printf("%s %d-%d %s\n",s[i+1].name,s[i+1].g,s[n-1-i].g,s[n-1-i].name);

}

printf("\nWould you like to change any result of Matchday%d?\n",j+1);

SetColor(12);

printf("\nPress Y to change the results.\n");

SetColor(14);

printf("Press any other key to continue without editing any of the results.\n");

SetColor(15);

e=getch();

if(e=='Y' | | e=='y')

{

printf("\nChoose the match number of the match whose outcome you want to change:\n");

for(i=0;i<n/2;i++)

{

if(n%2==0)

printf("Match %d:%s VS %s\n",i+1,s[i].name,s[n-1-i].name);

else

printf("Match %d:%s VS %s\n",i+1,s[i+1].name,s[n-1-i].name);

}

scanf("%d",&edit);

if(n%2==0)

{

printf("Match %d:%s VS %s\n",edit,s[edit-1].name,s[n-edit].name);

printf("Enter number of goals scored by %s:",s[edit-1].name);

scanf("%d",&s[edit-1].g);

}

else

{

printf("Match %d:%s VS %s\n",edit,s[edit].name,s[n-edit].name);

```

```

printf("Enter number of goals scored by %s:",s[edit].name);
scanf("%d",&s[edit].g);
}

printf("Enter number of goals scored by %s:",s[n-edit].name);
scanf("%d",&s[n-edit].g);
goto editresult1a;
}

match=fopen("matches.txt","a");
fprintf(match,"\nMatchday %d:\n",j+1);
for(i=0;i<n/2;i++)
{
    if(n%2==0)
        fprintf(match,"%s %d-%d %s\n",s[i].name,s[i].g,s[n-1-i].g,s[n-1-i].name);
    else
        fprintf(match,"%s %d-%d %s\n",s[i+1].name,s[i+1].g,s[n-1-i].g,s[n-1-i].name);
}
fclose(match);

SetColor(13);

printf("\nMatches have been recorded.\nYou can check the recorded matches by opening the text file
matches.txt.\n");

SetColor(14);

printf("\nPress any key to continue.\n");

SetColor(15);

e=getch();

if(n%2==0)
{
    for(i=0;i<n;i++)
    {
        s[i].p=s[i].p+1;
    }
}

```

```

s[i].GS=s[i].GS+s[i].g;
s[i].GA=s[i].GA+s[n-1-i].g;
s[i].GD=s[i].GS-s[i].GA;
if(s[i].g>s[n-1-i].g)
s[i].pts=s[i].pts+3;
else if(s[i].g==s[n-1-i].g)
s[i].pts=s[i].pts+1;
else
s[i].pts=s[i].pts;

}

}

else
{
    for(i=0;i<n;i++)
    {
        s[i+1].p=s[i+1].p+1;
        s[i+1].GS=s[i+1].GS+s[i+1].g;
        s[i+1].GA=s[i+1].GA+s[n-1-i].g;
        s[i+1].GD=s[i+1].GS-s[i+1].GA;
        if(s[i+1].g>s[n-1-i].g)
s[i+1].pts=s[i+1].pts+3;
        else if(s[i+1].g==s[n-1-i].g)
s[i+1].pts=s[i+1].pts+1;
        else
s[i+1].pts=s[i+1].pts;
    }
}
{
    for(i=0;i<n;i++)
    {

```

```

strcpy(t[i].name,s[i].name);
t[i].p=s[i].p;
t[i].GS=s[i].GS;
t[i].GA=s[i].GA;
t[i].GD=s[i].GD;
t[i].pts=s[i].pts;
t[i].len=s[i].len;
}

for(i=0;i<n;i++)
{
    for(k=i+1;k<n;k++)
    {
        if(t[i].pts<t[k].pts)
        {
            temp=t[i];
            t[i]=t[k];
            t[k]=temp;
        }
        else if(t[i].pts==t[k].pts)
        {
            if(t[i].GD<t[k].GD)
            {
                temp=t[i];
                t[i]=t[k];
                t[k]=temp;
            }
            else if(t[i].GD==t[k].GD)
            {
                if(t[i].GS<t[k].GS)

```

```

    {
        temp=t[i];
        t[i]=t[k];
        t[k]=temp;
    }
}

}

}

system("CLS");
stand=fopen("standings.txt","a");
SetColor(14);
printf("The standings at the end of matchday %d is as follows:\n",j+1);
fprintf(stand,"\nThe standings at the end of matchday %d is as follows:\n",j+1);
SetColor(15);
printf("#\tTeam\t\tPlayed\tGS\tGA\tGD\tPoints\n");
fprintf(stand,"#\tTeam\t\tPlayed\tGS\tGA\tGD\tPoints\n");
SetColor(11);
for(i=0;i<n;i++)
{
    if(t[i].len<8)
    {
        if(t[i].GD>0)
        {
            printf("%d\t%s\t\t%d\t%d\t%d\t%d\t%d\n",i+1,t[i].name,t[i].p,t[i].GS,t[i].GA,t[i].GD,t[i].pts);
            fprintf(stand,"%d\t%s\t\t%d\t%d\t%d\t%d\t%d\n",i+1,t[i].name,t[i].p,t[i].GS,t[i].GA,t[i].GD,t[i].pts);
        }
    }
}
else

```



```

{
printf("%d\t%s\t%d\t%d\t%d\t%d\n",i+1,t[i].name,t[i].p,t[i].GS,t[i].GA,t[i].GD,t[i].pts);
fprintf(stand,"%d\t%s\t%d\t%d\t%d\t%d\n",i+1,t[i].name,t[i].p,t[i].GS,t[i].GA,t[i].GD,t[i].pts);
}
}

fclose(stand);

SetColor(13);

printf("\nStandings have been recorded.\n");

printf("You can check the text file standings.txt for viewing the standings at the end of the matchdays
at any time.\n");

SetColor(15);

}

if(l%2==0)

{
for(i=0;i<n/2;i++)

{
if(n%2==0)

{
temp=s[i];
s[i]=s[n-1-i];
s[n-1-i]=temp;
}

else

{
temp=s[i+1];
s[i+1]=s[n-1-i];
s[n-1-i]=temp;
}
}
}

```

```

}

}

if(n%2==0)

{
for(i=0;i<n-2;i++)

{
    temp=s[i];
    s[i]=s[i+1];
    s[i+1]=temp;
}

}

else

{
for(i=0;i<n-1;i++)

{
    temp=s[i];
    s[i]=s[i+1];
    s[i+1]=temp;
}

}

j++;

}

}

fclose(rv);

fclose(rr);

SetColor(11);

printf("\nCongratulations %s! You have won the %s.\n",t[0].name,tnmt);

SetColor(14);

printf("\t\t\t @\n");

```

```

printf("\t\t\t@ #####@ @\n");
printf("\t\t\t@ ##### @\n");
printf("\t\t\t @ ##### @\n");
printf("\t\t\t @ #####@\n");
printf("\t\t\t### \n");
printf("\t\t\t#\n");
printf("\t\t\t#\n");
printf("\t\t\t###\n");
printf("\t\t\t###\n");

SetColor(15);

}

void knockout(int n,int nl,char tnmt[50])

{
    int i,j,k,l,legs,final,a,b,p,r,edit,sread=-1,lf,x,y,mid,end;
    FILE *kt,*kv,*match;
    struct teams s[100],temp;
    char e,random[100];
    srand(time(NULL));
    if(nl==2)
    {
        kv=fopen("knockout variables.txt","rb");
        while(!feof(kv))
        {
            fscanf(kv,"%d%d%d%d%d%d%d",&legs,&final,&b,&lf,&y,&n,&x,&mid,&end);
        }
        fclose(kv);
        kt=fopen("knockout teams.txt","rb");
        while(!feof(kt))
        {

```

```

fread(&s[++sread],sizeof(struct teams),1,kt);
}

fclose(kt);

if(lf==1)
    goto load1;
else if(lf==2)
    goto load2;
}

match=fopen("matches.txt","w");
fclose(match);

end=1;

x=0;
mid=0;

printf("How many times do the teams play each other?\n");
scanf("%d",&legs);

printf("How many times do they play each other in the final?\n");
scanf("%d",&final);

system("CLS");

for(i=0;i<n;i++)
{
    s[i].check=1;
}

for(i=0;i<n;i++)
{
    SetColor(i%5+10);
    printf("Enter the name of team %d:",i+1);
    scanf(" %[^\n]s ",s[i].name);
}

system("CLS");

```

```

SetColor(15);

printf("Would you like to randomize the order of the teams?\n");

SetColor(14);

printf("\nPress Y to randomize\n");

SetColor(13);

printf("Press any other key to continue without randomizing.\n");

SetColor(14);

e=getch();

if(e=='Y' | | e=='y')

{

for(i=0;i<n;i++)

{

j=(rand()% (n-1))+1;

strcpy(random,s[i].name);

strcpy(s[i].name,s[j].name);

strcpy(s[j].name,random);

}

printf("Randomized!!!\n");

SetColor(14);

printf("Press any key to continue.\n");

SetColor(15);

e=getch();

}

for(i=0;i<=6;i++)

{

a=pow(2,i);

if(n<=a)

break;

}

```

```

b=a-n;

for(i=0;i<n;i++)
{
    s[i].agg=0;
}

y=0;

load1:

kt=fopen("knockout teams.txt","wb");

kv=fopen("knockout variables.txt","wb");

system("CLS");

if(b!=0)

printf("The following teams have received bye to the next round:\n");

for(i=0;i<b;i++)

{

    SetColor(i%5+10);

    printf("%s\n",s[i].name);

}

SetColor(10);

printf("\n");

match=fopen("matches.txt","w");

if(n<=2)

{

printf("Final:\n");

fprintf(match,"Final:\n");

}

else if(n<=4)

{

printf("Semi Finals:\n");

fprintf(match,"Semi Finals:\n");

```

```

}

else if (n<=8)

{

printf("Quarter Finals:\n");

fprintf(match,"Quarter Finals:\n");

}

else

{

printf("Round 1:\n");

fprintf(match,"Round 1:\n");

}

fclose(match);

SetColor(15);

j=1;

for(i=b;i<(n+b)/2;i++)

{

printf("%s VS %s\n",s[i].name,s[n-j].name);

j++;

}

for(i=0;i<n;i++)

{

fwrite(&s[i],sizeof(struct teams),1,kt);

}

fclose(kt);

SetColor(10);

printf("\nData has been saved!\n");

SetColor(12);

printf("\nPress e to end the program.\n");

SetColor(11);

```

```

printf("Press any other key to continue\n");
e=getch();
if(e=='E'||e=='e')
{
lf=1;
fprintf(kv,"%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d",legs,final,b,lf,y,n,x,mid,end);
fclose(kv);
exit(0);
}

system("CLS");
if(n==2)
legs=final;
for(l=y;l<legs;l++)
{
j=0;
if(l%2!=0&&mid!=1)
{
for(i=b;i<(n+b)/2;i++)
{
j++;
temp=s[i];
s[i]=s[n-j];
s[n-j]=temp;
}
}

mid=0;
skippedk1:
j=0;

```

```

printf("\n");
SetColor(14);
match=fopen("matches.txt","a");
printf("Leg %d\n",l+1);
fprintf(match,"\nLeg %d:\n",l+1);
fclose(match);
SetColor(15);
for(i=b;i<(n+b)/2;i++)
{
    j++;
    if(s[i].check==1)
    {
        printf("\nMatch %d:%s VS %s\n",j,s[i].name,s[n-j].name);
        SetColor(12);
        printf("\nPress s to skip the match for now.\n");
        SetColor(14);
        printf("Press any other key to continue.\n");
        SetColor(15);
        e=getch();
        if(e!='S'&&e!='s')
        {
            s[i].check=0;
            s[n-j].check=0;
            printf("\nEnter the number of goals scored by %s:",s[i].name);
            scanf("%d",&s[i].goals);
            printf("Enter the number of goals scored by %s:",s[n-j].name);
            scanf("%d",&s[n-j].goals);
            s[i].agg=s[i].agg+s[i].goals;
            s[n-j].agg=s[n-j].agg+s[n-j].goals;
        }
    }
}

```

```

if(l==legs-1)
{
    if(s[i].agg<s[n-j].agg)
    {
        temp=s[i];
        s[i]=s[n-j];
        s[n-j]=temp;
    }
    else if(s[i].agg==s[n-j].agg)
    {
        restart:
        SetColor(13);
        printf("\nWho won on penalties?\nEnter 1 for %s\nEnter 2 for %s\n",s[i].name,s[n-j].name);
        SetColor(15);
        scanf("%d",&p);
        if(p==2)
        {
            temp=s[i];
            s[i]=s[n-j];
            s[n-j]=temp;
        }
        else if(p!=1)
        {
            SetColor(12);
            printf("Error!!!\n");
            SetColor(15);
            goto restart;
        }
    }
}

```

```

        }
    }
}

}

j=0;

system("CLS");

SetColor(11);

printf("\nRemaining matches:\n");

SetColor(15);

for(i=b;i<(n+b)/2;i++)

{
    j++;

    if(s[i].check==1)

    {
        printf("%s VS %s\n",s[i].name,s[n-j].name);

    }

}

kt=fopen("knockout teams.txt","wb");

for(i=0;i<n;i++)

{
    fwrite(&s[i],sizeof(struct teams),1,kt);

}

fclose(kt);

SetColor(10);

printf("\nData has been saved!\n");

SetColor(12);

printf("\nPress e to end the program.\n");

SetColor(14);

printf("Press any other key to continue.\n");

```

```

SetColor(15);

e=getch();

if(e=='E' | | e=='e')

{

lf=1;

y=l;

mid=1;

fprintf(kv,"%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d",legs,final,b,lf,y,n,x,mid,end);

fclose(kv);

exit(0);

}

for(i=b;i<(n+b)/2;i++)

{

if(s[i].check==1)

goto skippedk1;

}

for(i=0;i<n;i++)

{

s[i].check=1;

}

editresultk1:

printf("\n");

j=0;

for(i=b;i<(n+b)/2;i++)

{

j++;

printf("%s %d-%d %s\n",s[i].name,s[i].goals,s[n-j].goals,s[n-j].name);

}

SetColor(11);

```

```

printf("\nWould you like to change any result of the results?\n");

SetColor(14);

printf("\nPress Y to change\n");

SetColor(12);

printf("Press any other key to continue without changing any of the results.\n");

SetColor(15);

e=getch();

if(e=='Y' | | e=='y')

{

j=0;

SetColor(10);

printf("\nChoose the match number of the match whose outcome you want to change:\n");

SetColor(15);

for(i=b;i<(n+b)/2;i++)

{

j++;

printf("Match %d:%s VS %s\n",j,s[i].name,s[n-j].name);

}

scanf("%d",&edit);

s[b+edit-1].agg=s[b+edit-1].agg-s[b+edit-1].goals;

s[n-edit].agg=s[n-edit].agg-s[n-edit].goals;

printf("Match %d:%s VS %s\n",edit,s[b+edit-1].name,s[n-edit].name);

printf("Enter number of goals scored by %s:",s[b+edit-1].name);

scanf("%d",&s[b+edit-1].goals);

printf("Enter number of goals scored by %s:",s[n-edit].name);

scanf("%d",&s[n-edit].goals);

s[b+edit-1].agg=s[b+edit-1].agg+s[b+edit-1].goals;

s[n-edit].agg=s[n-edit].agg+s[n-edit].goals;

if(l==legs-1)

```

```

{
if(s[b+edit-1].agg<s[n>Edit 2 for %s\n",s[b+edit-1].name,s[n-edit].name);

scanf("%d",&p);

if(p==2)

{
temp=s[b+edit-1];
s[b+edit-1]=s[n>Edit 1 for %s\n",s[b+edit-1].name,s[n-edit].name);

scanf("%d",&p);

if(p==2)

{
temp=s[b+edit-1];
s[b+edit-1]=s[n>Edit 1 for %s\n",s[b+edit-1].name,s[n-edit].name);

scanf("%d",&p);

if(p!=1)

{
SetColor(12);
printf("Error!\n");
SetColor(15);
goto restart;
}

}
}

}
}

goto editresultk1;

```

```

}

match=fopen("matches.txt","a");

j=0;

for(i=b;i<(n+b)/2;i++)
{
    j++;
    fprintf(match,"%s %d-%d %s\n",s[i].name,s[i].goals,s[n-j].goals,s[n-j].name);
}
fclose(match);

SetColor(13);

printf("\nThe matches have been recorded.\nYou can check the recorded matches by opening the
text file matches.txt.\n");

SetColor(14);

printf("\nPress any key to continue.\n");

SetColor(15);

e=getch();

if(l%2!=0&&l!=legs-1)

{
    j=0;
    for(i=b;i<(n+b)/2;i++)
    {
        j++;
        temp=s[i];
        s[i]=s[n-j];
        s[n-j]=temp;
    }
}

kt=fopen("knockout teams.txt","wb");

for(i=0;i<n;i++)

```

```

{
fwrite(&s[i],sizeof(struct teams),1,kt);
}
fclose(kt);

SetColor(10);

printf("\nData has been saved!\n");

SetColor(12);

printf("\nPress e to end the program.\n");

SetColor(14);

printf("Press any other key to continue\n");

SetColor(15);

e=getch();

if(e=='E' || e=='e')

{
lf=1;

y=l+1;

fprintf(kv,"%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d",legs,final,b,lf,y,n,x,mid,end);

fclose(kv);

exit(0);

}

system("CLS");

}

fclose(kv);

j=0;

system("CLS");

SetColor(11);

match=fopen("matches.txt","a");

printf("The aggregate scores are:\n");

fprintf(match,"\nThe aggregate scores are:\n");

```

```

SetColor(15);

for(i=b;i<(n+b)/2;i++)
{
    j++;
    printf("%s %d-%d %s\n",s[i].name,s[i].agg,s[n-j].agg,s[n-j].name);
    fprintf(match,"%s %d-%d %s\n",s[i].name,s[i].agg,s[n-j].agg,s[n-j].name);
}
fclose(match);

if(n/2!=1)
{
    SetColor(11);

printf("\nThe following teams have advanced to the next round:\n");

for(i=b;i<(n+b)/2;i++)
{
    SetColor(i%5+10);

printf("%s\n",s[i].name);
}
}

n=b+j;
y=0;

load2:

SetColor(15);

kv=fopen("knockout variables.txt","wb");

for(k=x;n!=1;k++)
{
    if(end==1)
    {
        for(i=0;i<n;i++)
    {

```

```

s[i].agg=0;
}
}

SetColor(14);
printf("\n");
match=fopen("matches.txt","a");
if(n==2)
{
printf("Final:\n");
fprintf(match,"\nFinal:\n");
}
else if(n==4)
{
printf("Semi Finals:\n");
fprintf(match,"\nSemi Finals:\n");
}
else if (n==8)
{
printf("Quarter Finals:\n");
fprintf(match,"\nQuarter Finals:\n");
}
else
{
printf("Round %d:\n",k+2);
fprintf(match,"\nRound %d:\n",k+2);
}
fclose(match);
SetColor(15);
for(i=0;i<n/2;i++)

```

```

{
    printf("%s VS %s\n",s[i].name,s[n-1-i].name);
}

kt=fopen("knockout teams.txt","wb");

for(i=0;i<n;i++)
{
    fwrite(&s[i],sizeof(struct teams),1,kt);
}

fclose(kt);

SetColor(10);

printf("\nData has been saved!\n");

SetColor(12);

printf("\nPress e to end the program.");

SetColor(14);

printf("\nPress any other key to continue.\n");

SetColor(15);

e=getch();

if(e=='E' | e=='e')
{
    lf=2;
    x=k;

    fprintf(kv,"%d%\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d",legs,final,b,lf,y,n,x,mid,end);

    fclose(kv);

    exit(0);
}

if(n==2)
    legs=final;

for(l=y;l<legs;l++)
{

```

```

system("CLS");
if(l%2!=0&&mid!=1)
{
    for(i=0;i<n/2;i++)
    {
        temp=s[i];
        s[i]=s[n-1-i];
        s[n-1-i]=temp;
    }
}
mid=0;
skippedk2:
printf("\n");
SetColor(14);
match=fopen("matches.txt","a");
printf("Leg %d:\n",l+1);
fprintf(match,"\nLeg %d:\n",l+1);
fclose(match);
SetColor(15);
for(i=0;i<n/2;i++)
{
    if(s[i].check==1)
    {
        printf("\nMatch %d:%s VS %s\n",i+1,s[i].name,s[n-1-i].name);
        SetColor(12);
        printf("\nPress s to skip the match for now.\n");
        SetColor(14);
        printf("Press any other key to continue.\n");
        SetColor(15);
    }
}

```

```

e=getch();

if(e!='S'&&e!='s')

{

s[i].check=0;

s[n-1-i].check=0;

printf("\nEnter the number of goals scored by %s:",s[i].name);

scanf("%d",&s[i].goals);

printf("Enter the number of goals scored by %s:",s[n-1-i].name);

scanf("%d",&s[n-1-i].goals);

s[i].agg=s[i].agg+s[i].goals;

s[n-1-i].agg=s[n-1-i].agg+s[n-1-i].goals;

if(l==legs-1)

{

if(s[i].agg<s[n-1-i].agg)

{

temp=s[i];

s[i]=s[n-1-i];

s[n-1-i]=temp;

}

else if(s[i].agg==s[n-1-i].agg)

{

restart1:

SetColor(13);

printf("Who won on penalties?\nEnter 1 for %s\nEnter 2 for %s\n",s[i].name,s[n-1-i].name);

SetColor(15);

scanf("%d",&p);

if(p==2)

{

temp=s[i];

```

```

    s[i]=s[n-1-i];
    s[n-1-i]=temp;
}
else if(p!=1)
{
    SetColor(12);
    printf("Error!\n");
    goto restart1;
}
}
}
}
}

SetColor(11);
printf("\nRemaining matches:\n");
SetColor(15);
for(i=0;i<n/2;i++)
{
    if(s[i].check==1)
    {
        printf("%s VS %s\n",s[i].name,s[n-1-i].name);
    }
}
kt=fopen("knockout teams.txt","wb");
for(i=0;i<n;i++)
{
    fwrite(&s[i],sizeof(struct teams),1,kt);
}

```

```

fclose(kt);

SetColor(10);

printf("\nData has been saved!\n");

SetColor(12);

printf("\nPress e to end the program.");

SetColor(14);

printf("\nPress any other key to continue.\n");

SetColor(15);

e=getch();

if(e=='E' | | e=='e')

{

lf=2;

y=l;

mid=1;

end=0;

fprintf(kv,"%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d",legs,final,b,lf,y,n,x,mid,end);

fclose(kv);

exit(0);

}

for(i=0;i<n/2;i++)

{

if(s[i].check==1)

goto skippedk2;

}

for(i=0;i<n;i++)

{

s[i].check=1;

}

editresultk2:

```

```

printf("\n");

for(i=0;i<n/2;i++)
{
    printf("%s %d-%d %s\n",s[i].name,s[i].goals,s[n-1-i].goals,s[n-1-i].name);
}

SetColor(11);

printf("\nWould you like to change any result of the results?\n");

SetColor(14);

printf("Press Y to change the result.\n");

SetColor(12);

printf("Press any other key to continue without changing any of the results.\n");

SetColor(15);

e=getch();

if(e=='Y' | | e=='y')
{
    printf("\nChoose the match number of the match whose outcome you want to change:\n");

    for(i=0;i<n/2;i++)
    {
        printf("Match %d:%s VS %s\n",i+1,s[i].name,s[n-1-i].name);
    }

    scanf("%d",&edit);

    s[edit-1].agg=s[edit-1].agg-s[edit-1].goals;

    s[n-edit].agg=s[n-edit].agg-s[n-edit].goals;

    printf("Match %d:%s VS %s\n",edit,s[edit-1].name,s[n-edit].name);

    printf("Enter number of goals scored by %s:",s[edit-1].name);

    scanf("%d",&s[edit-1].goals);

    printf("Enter number of goals scored by %s:",s[n-edit].name);

    scanf("%d",&s[n-edit].goals);

    s[edit-1].agg=s[edit-1].agg+s[edit-1].goals;
}

```

```

s[n>Edit].agg=s[n>Edit].agg+s[n>Edit].goals;

if(l==legs-1)

{

if(s[edit-1].agg<s[n>Edit].agg)

{

temp=s[edit-1];

s[edit-1]=s[n>Edit];

s[n>Edit]=temp;

}

else if(s[edit-1].agg==s[n>Edit].agg)

{

erestart2:

SetColor(13);

printf("\nWho won on penalties?\nEnter 1 for %s\nEnter 2 for %s\n",s[edit-1].name,s[n>Edit].name);

SetColor(15);

scanf("%d",&p);

if(p==2)

{

temp=s[edit-1];

s[edit-1]=s[n>Edit];

s[n>Edit]=temp;

}

else if(p!=1)

{

SetColor(12);

printf("Error!\n");

SetColor(15);

goto erestart2;
}
}
}

```

```

        }

    }

}

goto editresultk2;

}

match=fopen("matches.txt","a");

for(i=0;i<n/2;i++)

{

    fprintf(match,"%s %d-%d %s\n",s[i].name,s[i].goals,s[n-1-i].goals,s[n-1-i].name);

}

fclose(match);

SetColor(13);

printf("\nThe matches have been recorded.\nYou can check the recorded matches by opening the
text file matches.txt.\n");

SetColor(14);

printf("\nPress any key to continue:\n");

SetColor(15);

e=getch();

if(l%2!=0&&l!=legs-1)

{

for(i=0;i<n/2;i++)

{

    temp=s[i];

    s[i]=s[n-1-i];

    s[n-1-i]=temp;

}

}

kt=fopen("knockout teams.txt","wb");

for(i=0;i<n;i++)

```

```

{
fwrite(&s[i],sizeof(struct teams),1,kt);
}
fclose(kt);

SetColor(10);

printf("\nData has been saved!\n");

SetColor(12);

printf("\nPress e to end the program.");

SetColor(14);

printf("\nPress any other key to continue\n");

SetColor(15);

e=getch();

if(e=='E' | | e=='e')

{
lf=2;

y=l+1;

fprintf(kv,"%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d",legs,final,b,lf,y,n,x,mid,end);

fclose(kv);

exit(0);

}

}

end=1;

system("CLS");

SetColor(11);

match=fopen("matches.txt","a");

printf("The aggregate scores are:\n");

fprintf(match,"\nThe aggregate scores are:\n");

SetColor(15);

for(i=0;i<n/2;i++)

```

```

{
    printf("%s %d-%d %s\n",s[i].name,s[i].agg,s[n-1-i].agg,s[n-1-i].name);
    fprintf(match,"%s %d-%d %s\n",s[i].name,s[i].agg,s[n-1-i].agg,s[n-1-i].name);
}
fclose(match);

if(n/2!=1)
{
printf("\nThe following teams have advanced to the next round:\n");
for(i=0;i<n/2;i++)
{
    SetColor(i%5+10);
    printf("%s\n",s[i].name);
}
}

SetColor(15);
n=n/2;
}

fclose(kv);

SetColor(11);

printf("\nCongratulations %s! You have won the %s.\n",s[0].name,tnmt);

SetColor(14);

printf("\t\t\t @\n");
printf("\t\t\t@ #####@\n");
printf("\t\t\t@ ##### @\n");
printf("\t\t\t@ ##### @\n");
printf("\t\t\t@ ##### @\n");
printf("\t\t\t @#####@\n");
printf("\t\t\t###\n");
printf("\t\t\t #\n");
printf("\t\t\t #\n");
}

```

```

printf("\t\t\t ###\n");
printf("\t\t\t ###\n");
SetColor(15);
}

void hybrid(int n,int nl,char tnmt[50])
{
    int h,i,j,k,l,m,p,tpg,ng,sum,min,z,adv,editg,edit,bye,power,legs,final,rem,ko,lf,mid,rc,sread=-1,y,x,end,host,ran;

    FILE *gt,*gv,*lt,*lv,*hv,*stand,*match,*group,*rlt;

    char random[100],e;

    struct general gen[100],swap;

    struct groups a[100],b[100],c[100];

    srand(time(NULL));

    if(nl==2)

    {
        hv=fopen("hybrid variables.txt","rb");

        while(!feof(hv))

        {
            fscanf(hv,"%d%d%d%d%d%d%d%d",&tpg,&m,&legs,&final,&ng,&min,&adv,&rem,&rc,&ko);

        }

        fclose(hv);

        if(rc==0)

        {
            gv=fopen("group variables.txt","rb");

            while(!feof(gv))

            {
                fscanf(gv,"%d%d%d",&y,&k,&mid);

            }

            fclose(gv);

        }
    }
}

```

```

gt=fopen("group teams.txt","rb");

while(!feof(gt))

{

fread(&a[++sread],sizeof(struct groups),1,gt);

}

fclose(gt);

goto load1;

}

else if(rc==1)

{

lv=fopen("latter stage variables.txt","rb");

while(!feof(lv))

{

fscanf(lv,"%d%d%d%d%d%d",&bye,&y,&n,&x,&mid,&end,&lf);

}

fclose(lv);

lt=fopen("latter stage teams.txt","rb");

while(!feof(lt))

{

fread(&gen[++sread],sizeof(struct general),1,lt);

}

fclose(lt);

sread=-1;

rlt=fopen("redraw latter stage teams.txt","rb");

while(!feof(rlt))

{

fread(&c[++sread],sizeof(struct groups),1,rlt);

}

fclose(rlt);

```

```

if(lf=2)
    goto load2;
else if(lf=3)
    goto load3;
}
}

match=fopen("matches.txt","w");
fclose(match);

stand=fopen("standings.txt","w");
fclose(stand);

rc=0;

lf=1;

mid=0;

k=0;

y=1;

end=1;

teamspergroup:

SetColor(15);

printf("Enter the number of teams per group:\n");

scanf("%d",&tpg);

printf("How many times do the teams play each other?\n");

scanf("%d",&m);

printf("How many times do the teams play each other in the knockout stages?\n");

scanf("%d",&legs);

printf("How many times do they play each other in the final?\n");

scanf("%d",&final);

system("CLS");

min=tpg-1;

if(n%tpg==0)

```

```

{
ng=n/tpg;
for(i=0;i<ng;i++)
{
a[i].teams=tpg;
}
goto input;
}
else
ng=n/tpg+1;
i=0;
sum=0;
while(1)
{
sum=sum+tpg;
if(sum<n)
a[i].teams=tpg;
else
{
a[i].teams=n-i*tpg;
break;
}
i++;
}
if(min-a[ng-1].teams>=(ng-1))
{
SetColor(12);
printf("Almost Even distribution of teams cannot be done with %d teams per group.\nPlease choose
a different number",tpg);
}

```

```

SetColor(15);

goto teamspergroup;

}

i=ng-2;

j=0;

while(j<min-a[ng-1].teams)

{

a[i].teams=a[i].teams-1;

i--;

j++;

}

a[ng-1].teams=min;

input:

for(i=0;i<n;i++)

{

SetColor(i%5+10);

printf("Enter the name of Team%d:",i+1);

scanf(" %[^\n]s ",gen[i].name);

}

system("CLS");

SetColor(11);

rerandomize:

printf("Would you like to randomize the order of the teams?\n");

SetColor(14);

printf("Press Y to randomize.\n");

SetColor(12);

printf("Press any other key to continue without randomizing.\n");

SetColor(15);

e=getch();

```

```

if(e=='Y' | | e=='y')
{
printf("Choose:\n");
SetColor(14);

printf("1.All the teams will be randomized.\n");
SetColor(11);

printf("2.All the teams apart from the host will be randomized.\n(The first team you had entered is
regarded as the host.)\n");

SetColor(15);

scanf("%d",&host);

if(host==1)
ran=0;

else if(host==2)
ran=1;

else
{
SetColor(12);

printf("Error!!!\n");
SetColor(15);

goto rerandomize;
}

for(i=ran;i<n;i++)
{
j=(rand()% (n-1))+1;
strcpy(random,gen[i].name);
strcpy(gen[i].name,gen[j].name);
strcpy(gen[j].name,random);
}

SetColor(10);

```

```

printf("Randomized!\n");

SetColor(15);

}

system("CLS");

z=0;

for(i=0;i<ng;i++)

{

    for(j=0;j<a[i].teams;j++)

    {

        strcpy(a[i].grp[j].name,gen[z].name);

        z++;

    }

}

for(j=0;j<ng;j++)

{

    for(i=0;i<a[j].teams;i++)

    {

        a[j].grp[i].pts=0;

        a[j].grp[i].GS=0;

        a[j].grp[i].GA=0;

        a[j].grp[i].GD=0;

        a[j].grp[i].p=0;

        a[j].grp[i].len=strlen(a[j].grp[i].name);

    }

}

group=fopen("groups.txt","w");

for(j=0;j<ng;j++)

{

```

```

printf("Group %d:\t\t",j+1);
fprintf(group,"Group %d:\t\t",j+1);

}

for(j=0;j<tpg;j++)
{
    printf("\n");
    fprintf(group,"\n");
    for(i=0;i<ng;i++)
    {
        if(a[i].grp[j].len<8)
        {
            printf("%s\t\t",a[i].grp[j].name);
            fprintf(group,"%s\t\t",a[i].grp[j].name);
        }
        else if(a[i].grp[j].len<16)
        {
            printf("%s\t",a[i].grp[j].name);
            fprintf(group,"%s\t",a[i].grp[j].name);
        }
        else
        {
            printf("%s",a[i].grp[j].name);
            fprintf(group,"%s",a[i].grp[j].name);
        }
    }
}

SetColor(13);

printf("\n\nThe groups have been recorded.\nYou can check the groups by opening the text file
groups.txt.\n");

```

```

SetColor(15);

printf("\nHow many teams from each group will advance to the next round?\n");

scanf("%d",&adv);

for(i=0;i<=6;i++)

{

    power=pow(2,i);

    if((adv*ng)<=power)

        break;

}

rem=power-(adv*ng);

if(rem!=0)

{

choose:

SetColor(11);

printf("Choose:\n");

SetColor(15);

printf("1)%d teams will qualify for the next round and some of the best placed teams will receive bye to the round after that.\n",adv*ng);

SetColor(14);

printf("2)%d next best placed teams out of %d groups will qualify for the next round along with the best %d teams of their groups\nand all the teams will take part in the 1st knockout round.\n",rem,ng,adv);

SetColor(15);

scanf("%d",&ko);

if(ko!=1&&ko!=2)

{

SetColor(12);

printf("Error!\n");

SetColor(15);

goto choose;
}

```

```

}

}

for(i=0;i<ng;i++)
{
    for(j=0;j<a[i].teams;j++)
    {
        a[i].check[j]=1;
    }
}

printf("\n");

if(tpg%2!=0)
tpg=tpg+1;

hv=fopen("hybrid variables.txt","wb");

fprintf(hv,"%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d",tpg,m,legs,final,ng,min,adv,rem,rc,ko);

fclose(hv);

gt=fopen("group teams.txt","wb");

for(i=0;i<ng;i++)
{
    fwrite(&a[i],sizeof(struct groups),1,gt);
}

fclose(gt);

SetColor(10);

printf("\nData has been saved.\n");

SetColor(15);

gv=fopen("group variables.txt","wb");

SetColor(12);

printf("\nPress e to end the program.");

SetColor(14);

printf("\nPress any other key to continue.\n");

```

```

SetColor(15);

e=getch();

if(e=='E' | | e=='e')

{

fprintf(gv,"%d%\n%d\n%d",y,k,mid);

fclose(gv);

exit(0);

}

fclose(gv);

load1:

system("CLS");

//



gv=fopen("group variables.txt","wb");

for(l=y;l<=m;l++)

{

while(k<(l*tpg)-l)

{

gt=fopen("group teams.txt","wb");

for(i=0;i<ng;i++)

{

fwrite(&a[i],sizeof(struct groups),1,gt);

}

fclose(gt);

SetColor(10);

printf("\nData has been saved!\n");

SetColor(15);

if(l%2==0 && mid!=1)

{

for(i=0;i<ng;i++)

```

```

{
    if(a[i].teams%2==0)
    {
        for(j=0;j<a[i].teams/2;j++)
        {
            a[i].temp=a[i].grp[j];
            a[i].grp[j]=a[i].grp[a[i].teams-1-j];
            a[i].grp[a[i].teams-1-j]=a[i].temp;
        }
    }
    else
    {
        for(j=0;j<a[i].teams/2;j++)
        {
            a[i].temp=a[i].grp[j+1];
            a[i].grp[j+1]=a[i].grp[a[i].teams-1-j];
            a[i].grp[a[i].teams-1-j]=a[i].temp;
        }
    }
}
mid=0;
match=fopen("matches.txt","a");
printf("\nMatchday %d:\n",k+1);
fprintf(match,"\nMatchday %d:\n",k+1);
fclose(match);
for(i=0;i<ng;i++)
{
    if(a[i].teams%2==0&&a[i].teams-1<=(k%(tpg-1)))

```

```

break;

printf("\n");

printf("Group %d:\n",i+1);

for(j=0;j<a[i].teams/2;j++)

{

    if(a[i].teams%2==0)

        printf("%s VS %s\n",a[i].grp[j].name,a[i].grp[a[i].teams-1-j].name);

    else

        printf("%s VS %s\n",a[i].grp[j+1].name,a[i].grp[a[i].teams-1-j].name);

}

}

SetColor(12);

printf("\nPress e to end the program.");

SetColor(10);

printf("\nPress any other key to continue.\n");

SetColor(15);

e=getch();

if(e=='E' | | e=='e')

{

    y=l;

    fprintf(gv,"%d%\n%d\n%d",y,k,mid);

    fclose(gv);

    exit(0);

}

skippedg1:

for(i=0;i<ng;i++)

{

printf("\nGroup %d:\n",i+1);

if(a[i].teams%2==0)

```

```

{
if(a[i].teams%2==0&&a[i].teams-1<=(k%(tpg-1)))
break;
for(j=0;j<a[i].teams/2;j++)
{
if(a[i].check[j]==1)
{
printf("\n");
printf("Match %d:%s VS %s\n",j+1,a[i].grp[j].name,a[i].grp[a[i].teams-1-j].name);
SetColor(12);
printf("\nPress s to skip the match for now.\n");
SetColor(10);
printf("Press any other key to continue.\n");
SetColor(15);
e=getch();
if(e!='S'&&e!='s')
{
a[i].check[j]=0;
printf("\nEnter number of goals scored by %s:",a[i].grp[j].name);
scanf("%d",&a[i].grp[j].g);
printf("Enter number of goals scored by %s:",a[i].grp[a[i].teams-1-j].name);
scanf("%d",&a[i].grp[a[i].teams-1-j].g);
}
}
}
else
{
for(j=0;j<a[i].teams/2;j++)
{
}
}
}

```

```

{
if(a[i].check[j+1]==1)
{
printf("\n");
printf("Match %d:%s VS %s\n",j+1,a[i].grp[j+1].name,a[i].grp[a[i].teams-1-j].name);
SetColor(12);
printf("\nPress s to skip the match for now\n");
SetColor(10);
printf("Press any other key to continue:\n\n");
SetColor(15);
e=getch();
if(e!='S'&&e!='s')
{
a[i].check[j+1]=0;
printf("Enter number of goals scored by %s:",a[i].grp[j+1].name);
scanf("%d",&a[i].grp[j+1].g);
printf("Enter number of goals scored by %s:",a[i].grp[a[i].teams-1-j].name);
scanf("%d",&a[i].grp[a[i].teams-1-j].g);
}
}
}
}

system("CLS");
SetColor(11);
printf("\nRemaining matches:\n");
SetColor(15);
for(i=0;i<ng;i++)
{

```

```

if(a[i].teams%2==0&&a[i].teams-1<=(k%(tpg-1)))
break;
printf("\n");
printf("Group %d:\n",i+1);
if(a[i].teams%2==0)
{
for(j=0;j<a[i].teams/2;j++)
{
if(a[i].check[j]==1)
{
printf("%s VS %s\n",a[i].grp[j].name,a[i].grp[a[i].teams-1-j].name);
}
}
}
else
{
for(j=0;j<a[i].teams/2;j++)
{
if(a[i].check[j+1]==1)
{
printf("%s VS %s\n",a[i].grp[j+1].name,a[i].grp[a[i].teams-1-j].name);
}
}
}
}

gt=fopen("group teams.txt","wb");
for(i=0;i<ng;i++)
{
fwrite(&a[i],sizeof(struct groups),1,gt);

```

```
}

fclose(gt);

SetColor(10);

printf("\nData has been saved!\n");

SetColor(12);

printf("\nPress e to end the program.");

SetColor(14);

printf("\nPress any other key to continue.\n");

SetColor(15);

e=getch();

if(e=='E'||e=='e')

{

y=l;

mid=1;

fprintf(gv,"%d%\n%d\n%d",y,k,mid);

fclose(gv);

exit(0);

}

for(i=0;i<ng;i++)

{

if(a[i].teams%2==0&&a[i].teams-1<=(k%(tpg-1)))

break;

if(a[i].teams%2==0)

{

for(j=0;j<a[i].teams/2;j++)

{

if(a[i].check[j]==1)

{



goto skippedg1;
```

```

    }
}

}

else
{
for(j=0;j<a[i].teams/2;j++)
{
if(a[i].check[j+1]==1)
{
goto skippedg1;
}
}
}

}

for(i=0;i<ng;i++)
{
if(a[i].teams%2==0&&a[i].teams-1<=(k%(tpg-1)))
break;
for(j=0;j<a[i].teams;j++)
{
a[i].check[j]=1;
}
}

printf("\n");

editresultg1:
printf("\n");
for(i=0;i<ng;i++)
{
if(a[i].teams%2==0&&a[i].teams-1<=(k%(tpg-1)))

```

```

break;

printf("Group %d:\n",i+1);

for(j=0;j<a[i].teams/2;j++)

{

if(a[i].teams%2==0)

printf("%s %d-%d %s\n",a[i].grp[j].name,a[i].grp[j].g,a[i].grp[a[i].teams-1-j].g,a[i].grp[a[i].teams-1-j].name);

else

printf("%s %d-%d %s\n",a[i].grp[j+1].name,a[i].grp[j+1].g,a[i].grp[a[i].teams-1-j].g,a[i].grp[a[i].teams-1-j].name);

}

}

SetColor(11);

printf("\nWould you like to change any result of Matchday %d?\n",k+1);

SetColor(12);

printf("\nPress Y to change the result.\n");

SetColor(10);

printf("Press any other key to continue without editing\n");

SetColor(15);

e=getch();

if(e=='Y' | | e=='y')

{

printf("\nChoose the group number and then the match number of the match whose outcome you want to change:\n");

for(i=0;i<ng;i++)

{

if(a[i].teams%2==0&&a[i].teams-1<=(k%(tpg-1)))

break;

printf("Group %d:\n",i+1);

for(j=0;j<a[i].teams/2;j++)

```

```

{
if(a[i].teams%2==0)
printf("Match %d:%s VS %s\n",j+1,a[i].grp[j].name,a[i].grp[a[i].teams-1-j].name);
else
printf("Match %d:%s VS %s\n",j+1,a[i].grp[j+1].name,a[i].grp[a[i].teams-1-j].name);
}
}

printf("Group:");
scanf("%d",&editg);
printf("Match:");
scanf("%d",&edit);
printf("Group %d:\n",editg);
if(a[editg-1].teams%2==0)
{
printf("Match %d:%s VS %s\n",edit,a[editg-1].grp[edit-1].name,a[editg-1].grp[a[editg-1].teams-edit].name);
printf("Enter number of goals scored by %s:",a[editg-1].grp[edit-1].name);
scanf("%d",&a[editg-1].grp[edit-1].g);
}
else
{
printf("Match %d:%s VS %s\n",edit,a[editg-1].grp[edit].name,a[editg-1].grp[a[editg-1].teams-edit].name);
printf("Enter number of goals scored by %s:",a[editg-1].grp[edit].name);
scanf("%d",&a[editg-1].grp[edit].g);
}
printf("Enter number of goals scored by %s:",a[editg-1].grp[a[editg-1].teams-edit].name);
scanf("%d",&a[editg-1].grp[a[editg-1].teams-edit].g);
goto editresultg1;
}

```

```

}

match=fopen("matches.txt","a");

for(i=0;i<ng;i++)
{
    if(a[i].teams%2==0&&a[i].teams-1<=(k%(tpg-1)))
        break;
    fprintf(match,"Group %d:\n",i+1);
    for(j=0;j<a[i].teams/2;j++)
    {
        if(a[i].teams%2==0)
            fprintf(match,"%s %d-%d %s\n",a[i].grp[j].name,a[i].grp[j].g,a[i].grp[a[i].teams-1-j].g,a[i].grp[a[i].teams-1-j].name);
        else
            fprintf(match,"%s %d-%d %s\n",a[i].grp[j+1].name,a[i].grp[j+1].g,a[i].grp[a[i].teams-1-j].g,a[i].grp[a[i].teams-1-j].name);
    }
}
fclose(match);

SetColor(13);

printf("\nThe matches have been recorded.\nYou can check the recorded matches by opening the
text file matches.txt.\n");

SetColor(14);

printf("\nPress any key to continue.\n");

SetColor(15);

e=getch();

for(i=0;i<ng;i++)
{
    if(a[i].teams%2==0&&a[i].teams-1<=(k%(tpg-1)))
        break;
    if(a[i].teams%2==0)

```

```

{
for(j=0;j<a[i].teams;j++)
{
a[i].grp[j].p=a[i].grp[j].p+1;
a[i].grp[j].GS=a[i].grp[j].GS+a[i].grp[j].g;
a[i].grp[j].GA=a[i].grp[j].GA+a[i].grp[a[i].teams-1-j].g;
a[i].grp[j].GD=a[i].grp[j].GS-a[i].grp[j].GA;
if(a[i].grp[j].g>a[i].grp[a[i].teams-1-j].g)
a[i].grp[j].pts=a[i].grp[j].pts+3;
else if(a[i].grp[j].g==a[i].grp[a[i].teams-1-j].g)
a[i].grp[j].pts=a[i].grp[j].pts+1;
else
a[i].grp[j].pts=a[i].grp[j].pts;
}
}

else
{
for(j=0;j<a[i].teams;j++)
{
a[i].grp[j+1].p=a[i].grp[j+1].p+1;
a[i].grp[j+1].GS=a[i].grp[j+1].GS+a[i].grp[j+1].g;
a[i].grp[j+1].GA=a[i].grp[j+1].GA+a[i].grp[a[i].teams-1-j].g;
a[i].grp[j+1].GD=a[i].grp[j+1].GS-a[i].grp[j+1].GA;
if(a[i].grp[j+1].g>a[i].grp[a[i].teams-1-j].g)
a[i].grp[j+1].pts=a[i].grp[j+1].pts+3;
else if(a[i].grp[j+1].g==a[i].grp[a[i].teams-1-j].g)
a[i].grp[j+1].pts=a[i].grp[j+1].pts+1;
else
a[i].grp[j+1].pts=a[i].grp[j+1].pts;
}
}

```

```

    }
}

}

{

for(i=0;i<ng;i++)

{
    if(a[i].teams%2==0&&a[i].teams-1<=(k%(tpg-1)))

        break;

    b[i]=a[i];

}

for(i=0;i<ng;i++)

{
    if(a[i].teams%2==0&&a[i].teams-1<=(k%(tpg-1)))

        break;

    for(j=0;j<b[i].teams;j++)

    {
        for(h=j+1;h<b[i].teams;h++)

        {

            if(b[i].grp[j].pts< b[i].grp[h].pts)

            {

                b[i].temp=b[i].grp[j];

                b[i].grp[j]=b[i].grp[h];

                b[i].grp[h]=b[i].temp;

            }

            else if(b[i].grp[j].pts==b[i].grp[h].pts)

            {

                if(b[i].grp[j].GD< b[i].grp[h].GD)

                {

                    b[i].temp=b[i].grp[j];

```

```

b[i].grp[j]=b[i].grp[h];
b[i].grp[h]=b[i].temp;
}
else if(b[i].grp[j].GD==b[i].grp[h].GD)
{
    if(b[i].grp[j].GS<b[i].grp[h].GS)
    {
        b[i].temp=b[i].grp[j];
        b[i].grp[j]=b[i].grp[h];
        b[i].grp[h]=b[i].temp;
    }
}
}
}
}

system("CLS");
stand=fopen("standings.txt","a");
printf("The standings at the end of matchday %d is as follows:\n",k+1);
fprintf(stand,"\nThe standings at the end of matchday %d is as follows:\n",k+1);
for(i=0;i<ng;i++)
{
SetColor(10);
printf("Group %d:\n",i+1);
fprintf(stand,"Group %d:\n",i+1);
SetColor(11);
printf("#\tTeam\t\tPlayed\tGS\tGA\tGD\tPoints\n");
fprintf(stand,"#\tTeam\t\tPlayed\tGS\tGA\tGD\tPoints\n");
SetColor(15);

```

```

for(j=0;j<a[i].teams;j++)
{
    if(b[i].grp[j].len<8)
    {
        if(b[i].grp[j].GD>0)
        {

printf("%d\t%s\t\t\t%d\t%d\t%d\t%d\n",j+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[j].G
A,b[i].grp[j].GD,b[i].grp[j].pts);

fprintf(stand,"%d\t%s\t\t\t%d\t%d\t%d\t%d\t%d\n",j+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].
grp[j].GA,b[i].grp[j].GD,b[i].grp[j].pts);

    }
    else
    {

printf("%d\t%s\t\t\t%d\t%d\t%d\t%d\t%d\n",j+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[j].GA
,b[i].grp[j].GD,b[i].grp[j].pts);

fprintf(stand,"%d\t%s\t\t\t%d\t%d\t%d\t%d\t%d\t%d\n",j+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].gr
p[j].GA,b[i].grp[j].GD,b[i].grp[j].pts);

    }
}

else if(b[i].grp[j].len<16)
{
    if(b[i].grp[j].GD>0)

printf("%d\t%s\t\t\t%d\t%d\t%d\t%d\t%d\n",j+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[j].GA,
b[i].grp[j].GD,b[i].grp[j].pts);

fprintf(stand,"%d\t%s\t\t\t%d\t%d\t%d\t%d\t%d\t%d\n",j+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].gr
p[j].GA,b[i].grp[j].GD,b[i].grp[j].pts);
}

```

```

    }

else

{



printf("%d\t%s\t\t%d\t%d\t%d\t%d\n",j+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[j].GA,
b[i].grp[j].GD,b[i].grp[j].pts);

fprintf(stand,"%d\t%s\t\t%d\t%d\t%d\t%d\t%d\n",j+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp
[j].GA,b[i].grp[j].GD,b[i].grp[j].pts);

}

}

else

{

if(b[i].grp[j].GD>0)

{



printf("%d\t%s\t%d\t%d\t%d\t%d\t%d\n",j+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[j].GA,b
[i].grp[j].GD,b[i].grp[j].pts);

fprintf(stand,"%d\t%s\t%d\t%d\t%d\t%d\t%d\t%d\n",j+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[
j].GA,b[i].grp[j].GD,b[i].grp[j].pts);

}

else

{



printf("%d\t%s\t%d\t%d\t%d\t%d\t%d\n",j+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[j].GA,b[i]
].grp[j].GD,b[i].grp[j].pts);

fprintf(stand,"%d\t%s\t%d\t%d\t%d\t%d\t%d\t%d\n",j+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[j]
.GA,b[i].grp[j].GD,b[i].grp[j].pts);

}

}

}

```

```

}

fclose(stand);

SetColor(13);

printf("\nStandings have been recorded.\n");

printf("You can check the text file standings.txt for checking the standings at the end of matchdays at
any time.\n");

SetColor(15);

}

if(l%2==0)

{

for(i=0;i<ng;i++)

{

if(a[i].teams%2==0)

{

for(j=0;j<a[i].teams/2;j++)

{

a[i].temp=a[i].grp[j];

a[i].grp[j]=a[i].grp[a[i].teams-1-j];

a[i].grp[a[i].teams-1-j]=a[i].temp;

}

}

else

{

for(j=0;j<a[i].teams/2;j++)

{

a[i].temp=a[i].grp[j+1];

a[i].grp[j+1]=a[i].grp[a[i].teams-1-j];

a[i].grp[a[i].teams-1-j]=a[i].temp;

}

}

```

```

        }

    }

}

for(i=0;i<ng;i++)
{
    if(a[i].teams%2==0&&a[i].teams-1<=(k%(tpg-1)))
        break;

    if(a[i].teams%2==0)
    {
        for(j=0;j<a[i].teams-2;j++)
        {
            a[i].temp=a[i].grp[j];
            a[i].grp[j]=a[i].grp[j+1];
            a[i].grp[j+1]=a[i].temp;
        }
    }
    else
    {
        for(j=0;j<a[i].teams-1;j++)
        {
            a[i].temp=a[i].grp[j];
            a[i].grp[j]=a[i].grp[j+1];
            a[i].grp[j+1]=a[i].temp;
        }
    }
}
k++;
}
}

```

```

fclose(gv);

if(ko==2)
{
j=adv;
for(i=0;i<ng;i++)
{
for(h=i+1;h<ng;h++)
{
if(b[h].teams==adv)
break;
if(b[i].grp[j].pts<b[h].grp[j].pts)
{
b[i].temp=b[i].grp[j];
b[i].grp[j]=b[h].grp[j];
b[h].grp[j]=b[i].temp;
}
else if(b[i].grp[j].pts==b[h].grp[j].pts)
{
if(b[i].grp[j].GD<b[h].grp[j].GD)
{
b[i].temp=b[i].grp[j];
b[i].grp[j]=b[h].grp[j];
b[h].grp[j]=b[i].temp;
}
else if(b[i].grp[j].GD==b[h].grp[j].GD)
{
if(b[i].grp[j].GS<b[h].grp[j].GS)
{
}
}
}
}
}
}

```

```

        b[i].temp=b[i].grp[j];
        b[i].grp[j]=b[h].grp[j];
        b[h].grp[j]=b[i].temp;
    }
}

}

}

stand=fopen("standings.txt","a");
printf("\nRanking of the next best teams:\n");
fprintf(stand,"\nRanking of the next best teams:\n");
SetColor(11);
printf("#\tTeam\t\tPlayed\tGS\tGA\tGD\tPoints\n");
fprintf(stand,"#\tTeam\t\tPlayed\tGS\tGA\tGD\tPoints\n");
SetColor(15);
j=adv;
for(i=0;i<ng;i++)
{
    if(a[i].teams==adv)
        break;
    if(b[i].grp[j].len<8)
    {
        if(b[i].grp[j].GD>0)
        {

printf("%d\t%s\t\t%d\t%d\t%d\t%d\t%d\t%d\n",i+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[j].G
A,b[i].grp[j].GD,b[i].grp[j].pts);

fprintf(stand,"%d\t%s\t\t%d\t%d\t%d\t%d\t%d\t%d\n",i+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].
grp[j].GA,b[i].grp[j].GD,b[i].grp[j].pts);

```

```

    }

    else

    {

printf("%d\t%s\t\t\t\t%d\t%d\t%d\t%d\n",i+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[j].GA
,b[i].grp[j].GD,b[i].grp[j].pts);

fprintf(stand,"%d\t%s\t\t\t\t%d\t%d\t%d\t%d\t%d\n",i+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].gr
p[j].GA,b[i].grp[j].GD,b[i].grp[j].pts);

}

}

else if(b[i].grp[j].len<16)

{

if(b[i].grp[j].GD>0)

{



printf("%d\t%s\t\t\t\t%d\t%d\t%d\t%d\n",i+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[j].GA,
b[i].grp[j].GD,b[i].grp[j].pts);

fprintf(stand,"%d\t%s\t\t\t\t%d\t%d\t%d\t%d\t%d\n",i+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].gr
p[j].GA,b[i].grp[j].GD,b[i].grp[j].pts);

}

else

{



printf("%d\t%s\t\t\t\t%d\t%d\t%d\t%d\n",i+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[j].GA,b
[i].grp[j].GD,b[i].grp[j].pts);

fprintf(stand,"%d\t%s\t\t\t\t%d\t%d\t%d\t%d\t%d\n",i+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].gr
p[j].GA,b[i].grp[j].GD,b[i].grp[j].pts);

}

}

else

```

```

{
    if(b[i].grp[j].GD>0)

    {

printf("%d\t%s\t%d\t%d\t%d\t%d\t%d\n",i+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[j].GA,b
[i].grp[j].GD,b[i].grp[j].pts);

fprintf(stand,"%d\t%s\t%d\t%d\t%d\t%d\t%d\t%d\n",i+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[
j].GA,b[i].grp[j].GD,b[i].grp[j].pts);

    }

else

{



printf("%d\t%s\t%d\t%d\t%d\t%d\t%d\t%d\n",i+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[j].GA,b[i]
.grp[j].GD,b[i].grp[j].pts);

fprintf(stand,"%d\t%s\t%d\t%d\t%d\t%d\t%d\t%d\n",i+1,b[i].grp[j].name,b[i].grp[j].p,b[i].grp[j].GS,b[i].grp[j]
.GA,b[i].grp[j].GD,b[i].grp[j].pts);

    }

}

}

fclose(stand);

SetColor(13);

printf("\nThe ranking of the next best placed teams have been recorded.\nYou can see the ranking by
opening the file standings.txt.\n");

}

SetColor(11);

printf("\nThe following teams have advanced to the next round:\n");

SetColor(15);

for(i=0;i<ng;i++)

{

printf("Group %d:\n",i+1);

```

```

for(j=0;j<adv;j++)
{
    SetColor(j%5+10);
    printf("%s\n",b[i].grp[j].name);
}
SetColor(15);

}

if(ko==2)
{
    SetColor(11);

    printf("\nThe following teams have advanced to the next round as the next best teams:\n");
    SetColor(15);

    j=adv;

    for(i=0;i<rem;i++)
    {
        SetColor(i%5+10);
        printf("%s\n",b[i].grp[j].name);
    }
}

SetColor(15);

rc=1;

hv=fopen("hybrid variables.txt","wb");

fprintf(hv,"%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d\n%d",tpg,m,legs,final,ng,min,adv,rem,rc,ko);

fclose(hv);

//knockout

y=0;

x=0;

mid=0;

end=1;

```

```

if(ko==2)
n=adv*ng+rem;
else
n=adv*ng;
for(j=0;j<adv;j++)
{
    for(i=0;i<ng;i++)
    {
        c[j].grp[i]=b[i].grp[j];
    }
}
if(ko==2)
{
j=adv;
for(i=0;i<rem;i++)
{
    c[j].grp[i]=b[i].grp[j];
}
}
redraw:
if(ng!=1)
{
for(j=0;j<adv;j++)
{
    for(i=0;i<ng;i++)
    {
        k=(rand()%((ng-1))+1;
        c[j].temp=c[j].grp[i];
        c[j].grp[i]=c[j].grp[k];
    }
}
}

```

```

c[j].grp[k]=c[j].temp;
}

}

}

if(ko==2&&rem!=1)

{
j=adv;

for(i=0;i<rem;i++)

{
k=(rand()%(rem-1))+1;

c[j].temp=c[j].grp[i];

c[j].grp[i]=c[j].grp[k];

c[j].grp[k]=c[j].temp;

}

}

k=0;

for(j=0;j<adv;j++)

{
for(i=0;i<ng;i++)

{
strcpy(gen[k].name,c[j].grp[i].name);

k++;

}

}

if(ko==2)

{
j=adv;

for(i=0;i<rem;i++)

{

```

```

strcpy(gen[k].name,c[j].grp[i].name);

k++;
}

}

for(i=0;i<n;i++)
{
    gen[i].check=1;
}

for(i=0;i<=6;i++)
{
    power=pow(2,i);
    if(n<=power)
        break;
}

bye=power-n;

for(i=0;i<n;i++)
{
    gen[i].agg=0;
}

load2:

lv=fopen("latter stage variables.txt","wb");
lt=fopen("latter stage teams.txt","wb");
rlt=fopen("redraw latter stage teams.txt","wb");

for(i=0;i<n;i++)
{
    fwrite(&gen[i],sizeof(struct general),1,lt);
    fwrite(&c[i],sizeof(struct groups),1,rlt);
}

fclose(lt);

```

```

fclose(rlt);

SetColor(10);

printf("\nData has been saved!\n");

SetColor(12);

printf("\nPress e to end the program.");

SetColor(14);

printf("\nPress any other key to continue\n");

SetColor(15);

e=getch();

if(e=='E' | | e=='e')

{

lf=2;

fprintf(lv,"%d\n%d\n%d\n%d\n%d\n%d\n%d",bye,y,n,x,mid,end,lf);

fclose(lv);

exit(0);

}

if(bye!=0)

printf("The following teams have received bye to the next round:\n");

for(i=0;i<bye;i++)

{

SetColor(i%5+10);

printf("%s\n",gen[i].name);

}

SetColor(15);

system("CLS");

printf("\n");

match=fopen("matches.txt","a");

fprintf(match,"\nKnockout Stage:\n");

if(n<=2)

```

```

{
printf("Final:\n");
fprintf(match,"\\nFinal:\\n");
}
else if(n<=4)
{
printf("Semi Finals:\\n");
fprintf(match,"\\nSemi Finals:\\n");
}
else if (n<=8)
{
printf("Quarter Finals:\\n");
fprintf(match,"\\nQuarter Finals:\\n");
}
else
{
printf("Round 2:\\n");
fprintf(match,"\\nRound 2:\\n");
}
fclose(match);
SetColor(15);
j=1;
for(i=bye;i<(n+bye)/2;i++)
{
printf("%s VS %s\\n",gen[i].name,gen[n-j].name);
j++;
}
SetColor(12);
printf("Press Y to redraw the matches.");

```

```

SetColor(10);

printf("\nPress any other key to continue without redrawing.\n");

SetColor(15);

e=getch();

if(e=='Y' || e=='y')

{

fclose(lv);

goto redraw;

}

lt=fopen("latter stage teams.txt","wb");

for(i=0;i<n;i++)

{

fwrite(&gen[i],sizeof(struct general),1,lt);

}

fclose(lt);

SetColor(10);

printf("\nData has been saved!\n");

SetColor(12);

printf("\nPress e to end the program.");

SetColor(14);

printf("\nPress any other key to continue.\n");

SetColor(15);

e=getch();

if(e=='E' || e=='e')

{

lf=2;

fprintf(lv,"%d\n%d\n%d\n%d\n%d\n%d\n%d",bye,y,n,x,mid,end,lf);

fclose(lv);

exit(0);

```

```

}

if(n==2)

legs=final;

for(l=y;l<legs;l++)

{

j=0;

if(l%2!=0&&mid!=1)

{

for(i=bye;i<(n+bye)/2;i++)

{

j++;

swap=gen[i];

gen[i]=gen[n-j];

gen[n-j]=swap;

}

}

mid=0;

skippedk1:

j=0;

system("CLS");

printf("\n");

match=fopen("matches.txt","a");

SetColor(14);

printf("Leg %d:\n",l+1);

fprintf(match,"\nLeg %d:\n",l+1);

fclose(match);

SetColor(15);

for(i=bye;i<(n+bye)/2;i++)

```

```

{
j++;
if(gen[i].check==1)
{
printf("\nMatch %d:%s VS %s\n",j,gen[i].name,gen[n-j].name);
SetColor(12);
printf("\nPress s to skip the match for now\n");
SetColor(10);
printf("Press any other key to continue:\n");
SetColor(15);
e=getch();
if(e!='S'&&e!='s')
{
gen[i].check=0;
gen[n-j].check=0;
printf("\nEnter the number of goals scored by %s:",gen[i].name);
scanf("%d",&gen[i].goals);
printf("Enter the number of goals scored by %s:",gen[n-j].name);
scanf("%d",&gen[n-j].goals);
gen[i].agg=gen[i].agg+gen[i].goals;
gen[n-j].agg=gen[n-j].agg+gen[n-j].goals;
if(l==legs-1)
{
if(gen[i].agg<gen[n-j].agg)
{
swap=gen[i];
gen[i]=gen[n-j];
gen[n-j]=swap;
}
}
}

```

```
else if(gen[i].agg==gen[n-j].agg)
{
    restart:
    SetColor(11);
    printf("Who won on penalties?");
    SetColor(10);
    printf("\nEnter 1 for %s",gen[i].name);
    SetColor(14);
    printf("\nEnter 2 for %s\n",gen[n-j].name);
    SetColor(15);
    scanf("%d",&p);
    if(p==2)
    {
        swap=gen[i];
        gen[i]=gen[n-j];
        gen[n-j]=swap;
    }
    else if(p!=1)
    {
        SetColor(12);
        printf("Error!\n");
        SetColor(15);
        goto restart;
    }
}
}
}
}
}
```

```

j=0;
system("CLS");
SetColor(11);
printf("\nRemaining matches:\n");
SetColor(15);
for(i=bye;i<(n+bye)/2;i++)
{
    j++;
    if(gen[i].check==1)
    {
        printf("%s VS %s\n",gen[i].name,gen[n-j].name);
    }
}
lt=fopen("latter stage teams.txt","wb");
for(i=0;i<n;i++)
{
    fwrite(&gen[i],sizeof(struct general),1,lt);
}
fclose(lt);
SetColor(10);
printf("\nData has been saved!\n");
SetColor(12);
printf("\nPress e to end the program.");
SetColor(10);
printf("\nPress any other key to continue.\n");
SetColor(15);
e=getch();
if(e=='E' | | e=='e')
{

```

```

lf=2;
y=l;
mid=1;
fprintf(lv,"%d\n%d\n%d\n%d\n%d\n%d",bye,y,n,x,mid,end,lf);
fclose(lv);
exit(0);
}

for(i=bye;i<(n+bye)/2;i++)
{
if(gen[i].check==1)
goto skippedk1;
}

for(i=0;i<n;i++)
{
gen[i].check=1;
}

editresultk1:
printf("\n");
j=0;
for(i=bye;i<(n+bye)/2;i++)
{
    j++;
    printf("%s %d-%d %s\n",gen[i].name,gen[i].goals,gen[n-j].goals,gen[n-j].name);
}
SetColor(11);
printf("\nWould you like to change any result of the results?");
SetColor(14);
printf("\nPress Y to change.\n");
SetColor(10);

```

```

printf("Press any other key to continue without editing.\n");

SetColor(15);

e=getch();

if(e=='Y' | | e=='y')

{

j=0;

printf("\nChoose the match number of the match whose outcome you want to change:\n");

SetColor(15);

for(i=bye;i<(n+bye)/2;i++)

{

j++;

printf("Match %d:%s VS %s\n",j,gen[i].name,gen[n-j].name);

}

scanf("%d",&edit);

gen[bye+edit-1].agg=gen[bye+edit-1].agg-gen[bye+edit-1].goals;

gen[n-edit].agg=gen[n-edit].agg-gen[n-edit].goals;

printf("Match %d:%s VS %s\n",edit,gen[bye+edit-1].name,gen[n-edit].name);

printf("Enter number of goals scored by %s:",gen[bye+edit-1].name);

scanf("%d",&gen[bye+edit-1].goals);

printf("Enter number of goals scored by %s:",gen[n-edit].name);

scanf("%d",&gen[n-edit].goals);

gen[bye+edit-1].agg=gen[bye+edit-1].agg+gen[bye+edit-1].goals;

gen[n-edit].agg=gen[n-edit].agg+gen[n-edit].goals;

if(l==legs-1)

{

if(gen[bye+edit-1].agg<gen[n-edit].agg)

{

swap=gen[bye+edit-1];

gen[bye+edit-1]=gen[n-edit];

```

```

gen[n>Edit]=swap;
}

else if(gen[bye+edit-1].agg==gen[n>Edit].agg)

{

    erestart:

    SetColor(11);

    printf("\nWho won on penalties?");

    SetColor(10);

    printf("\nEnter 1 for %s",gen[bye+edit-1].name);

    SetColor(14);

    printf("Enter 2 for %s\n",gen[n>Edit].name);

    SetColor(15);

    scanf("%d",&p);

    if(p==2)

    {

        swap=gen[bye+edit-1];

        gen[bye+edit-1]=gen[n>Edit];

        gen[n>Edit]=swap;

    }

    else if(p!=1)

    {

        SetColor(12);

        printf("Error!\n");

        SetColor(15);

        goto erestart;

    }

}

goto editresultk1;

```

```

}

match=fopen("matches.txt","a");

j=0;

for(i=bye;i<(n+bye)/2;i++)

{

    j++;

    fprintf(match,"%s %d-%d %s\n",gen[i].name,gen[i].goals,gen[n-j].goals,gen[n-j].name);

}

fclose(match);

SetColor(13);

printf("\nThe matches have been recorded.\nYou can check the recorded matches by opening the
text file matches.txt.\n");

SetColor(14);

printf("\nPress any key to continue.\n");

SetColor(15);

e=getch();

if(l%2!=0&&l!=legs-1)

{

j=0;

for(i=bye;i<(n+bye)/2;i++)

{

    j++;

    swap=gen[i];

    gen[i]=gen[n-j];

    gen[n-j]=swap;

}

}

lt=fopen("latter stage teams.txt","wb");

for(i=0;i<n;i++)

```

```

{
fwrite(&gen[i],sizeof(struct general),1,lt);
}
fclose(lt);

SetColor(10);

printf("\nData has been saved!\n");

SetColor(12);

printf("\nPress e to end the program.");

SetColor(14);

printf("\nPress any other key to continue.\n");

e=getch();

if(e=='E' | | e=='e')

{
lf=2;

y=l+1;

fprintf(lv,"%d\n%d\n%d\n%d\n%d\n%d",bye,y,n,x,mid,end,lf);

fclose(lv);

exit(0);

}

}

fclose(lv);

j=0;

system("CLS");

SetColor(11);

match=fopen("matches.txt","a");

printf("The aggregate scores are:\n");

fprintf(match,"\nThe aggregate scores are:\n");

SetColor(15);

for(i=bye;i<(n+bye)/2;i++)

```

```

{
    j++;
    printf("%s %d-%d %s\n",gen[i].name,gen[i].agg,gen[n-j].agg,gen[n-j].name);
    fprintf(match,"%s %d-%d %s\n",gen[i].name,gen[i].agg,gen[n-j].agg,gen[n-j].name);
}
fclose(match);

if(n/2!=1)
{
    SetColor(11);

    printf("\nThe following teams have advanced to the next round:\n");
    for(i=bye;i<(n+bye)/2;i++)
    {
        SetColor(i%5+10);

        printf("%s\n",gen[i].name);
    }
}

SetColor(15);

n=bye+j;

y=0;
load3:

lv=fopen("latter stage variables.txt","wb");

for(k=x;n!=1;k++)
{
    if(end==1)
    {
        for(i=0;i<n;i++)
        {
            gen[i].agg=0;
        }
    }
}

```

```

}

printf("\n");

SetColor(11);

match=fopen("matches.txt","a");

if(n==2)

{

printf("Final:\n");

fprintf(match,"\nFinal:\n");

}

else if(n==4)

{

printf("Semi Finals:\n");

fprintf(match,"\nSemi Finals:\n");

}

else if (n==8)

{

printf("Quarter Finals:\n");

fprintf(match,"\nQuarter Finals:\n");

}

else

{

printf("Round %d:\n",k+3);

fprintf(match,"\nRound %d:\n",k+3);

}

fclose(match);

SetColor(15);

for(i=0;i<n/2;i++)

{

printf("%s VS %s\n",gen[i].name,gen[n-1-i].name);

```

```

}

lt=fopen("latter stage teams.txt","wb");

for(i=0;i<n;i++)
{
    fwrite(&gen[i],sizeof(struct general),1,lt);

}

fclose(lt);

SetColor(10);

printf("\nData has been saved!\n");

SetColor(12);

printf("\nPress e to end the program.");

SetColor(14);

printf("\nPress any other key to continue.\n");

SetColor(15);

e=getch();

if(e=='E' | | e=='e')
{
    lf=3;
    x=k;

    fprintf(lv,"%d\n%d\n%d\n%d\n%d\n%d",bye,y,n,x,mid,end,lf);
    fclose(lv);
    exit(0);
}

if(n==2)
legs=final;

for(l=0;l<legs;l++)
{
    if(l%2!=0&&mid!=1)
    {

```

```

for(i=0;i<n/2;i++)
{
    swap=gen[i];
    gen[i]=gen[n-1-i];
    gen[n-1-i]=swap;
}
mid=0;

skippedk2:
printf("\n");
match=fopen("matches.txt","a");
SetColor(14);
printf("Leg %d:\n",l+1);
fprintf(match,"\nLeg %d:\n",l+1);
fclose(match);
SetColor(15);
for(i=0;i<n/2;i++)
{
    if(gen[i].check==1)
    {
        printf("\nMatch %d:%s VS %s\n",i+1,gen[i].name,gen[n-1-i].name);
        SetColor(12);
        printf("\nPress s to skip the match for now.\n");
        SetColor(10);
        printf("Press any other key to continue.\n");
        SetColor(15);
        e=getch();
        if(e!='S'&&e!='s')
    {

```

```

gen[i].check=0;
gen[n-1-i].check=0;
printf("\nEnter the number of goals scored by %s:",gen[i].name);
scanf("%d",&gen[i].goals);
printf("Enter the number of goals scored by %s:",gen[n-1-i].name);
scanf("%d",&gen[n-1-i].goals);
gen[i].agg=gen[i].agg+gen[i].goals;
gen[n-1-i].agg=gen[n-1-i].agg+gen[n-1-i].goals;
if(l==legs-1)
{
if(gen[i].agg<gen[n-1-i].agg)
{
swap=gen[i];
gen[i]=gen[n-1-i];
gen[n-1-i]=swap;
}
else if(gen[i].agg==gen[n-1-i].agg)
{
restart1:
SetColor(11);
printf("Who won on penalties?");
SetColor(13);
printf("\nEnter 1 for %s",gen[i].name);
SetColor(14);
printf("\nEnter 2 for %s\n",gen[n-1-i].name);
SetColor(15);
scanf("%d",&p);
if(p==2)
{

```

```

swap=gen[i];
gen[i]=gen[n-1-i];
gen[n-1-i]=swap;
}

else if(p!=1)
{
SetColor(12);
printf("Error!\n");
goto restart1;
}

}

}

}

}

}

system("CLS");
SetColor(11);
printf("\nRemaining matches:\n");
SetColor(15);
for(i=0;i<n/2;i++)
{
if(gen[i].check==1)
{
printf("%s VS %s\n",gen[i].name,gen[n-1-i].name);
}
}

lt=fopen("latter stage teams.txt","wb");
for(i=0;i<n;i++)
{

```

```

fwrite(&gen[i],sizeof(struct general),1,lt);

}

fclose(lt);

SetColor(10);

printf("\nData has been saved.\n");

SetColor(12);

printf("\nPress e to end the program.");

SetColor(14);

printf("\nPress any other key to continue\n");

SetColor(15);

e=getch();

if(e=='E' | | e=='e')

{

lf=3;

y=l;

mid=1;

end=0;

fprintf(lv,"%d\n%d\n%d\n%d\n%d\n%d",bye,y,n,x,mid,end,lf);

fclose(lv);

exit(0);

}

for(i=0;i<n/2;i++)

{

if(gen[i].check==1)

goto skippedk2;

}

for(i=0;i<n;i++)

{

gen[i].check=1;

```

```

}

editresultk2:
printf("\n");
for(i=0;i<n/2;i++)
{
    printf("%s %d-%d %s\n",gen[i].name,gen[i].goals,gen[n-1-i].goals,gen[n-1-i].name);
}
printf("\nWould you like to change any result of the results?\n");
SetColor(12);
printf("\nPress Y to change the result.\n");
SetColor(10);
printf("Press any other key to continue without editing.\n");
SetColor(15);
e=getch();
if(e=='Y' | | e=='y')
{
printf("\nChoose the match number of the match whose outcome you want to change:\n");
for(i=0;i<n/2;i++)
{
    printf("Match %d:%s VS %s\n",i+1,gen[i].name,gen[n-1-i].name);
}
scanf("%d",&edit);
gen[edit-1].agg=gen[edit-1].agg-gen[edit-1].goals;
gen[n>Edit].agg=gen[n>Edit].agg-gen[n>Edit].goals;
printf("Match %d:%s VS %s\n",edit,gen[edit-1].name,gen[n>Edit].name);
printf("Enter number of goals scored by %s:",gen[edit-1].name);
scanf("%d",&gen[edit-1].goals);
printf("Enter number of goals scored by %s:",gen[n>Edit].name);
scanf("%d",&gen[n>Edit].goals);
}

```

```

gen[edit-1].agg=gen[edit-1].agg+gen[edit-1].goals;
gen[n-edit].agg=gen[n-edit].agg+gen[n-edit].goals;
if(l==legs-1)
{
if(gen[edit-1].agg<gen[n-edit].agg)
{
swap=gen[edit-1];
gen[edit-1]=gen[n-edit];
gen[n-edit]=swap;
}
else if(gen[edit-1].agg==gen[n-edit].agg)
{
erestart2:
SetColor(11);
printf("Who won on penalties?");
SetColor(10);
printf("\nEnter 1 for %s",gen[edit-1].name);
SetColor(14);
printf("\nEnter 2 for %s\n",gen[n-edit].name);
SetColor(15);
scanf("%d",&p);
if(p==2)
{
swap=gen[edit-1];
gen[edit-1]=gen[n-edit];
gen[n-edit]=swap;
}
else if(p!=1)
{

```

```

SetColor(12);
printf("Error!\n");
SetColor(15);
goto erestart2;
}
}

}

}

goto editresultk2;
}

match=fopen("matches.txt","a");
for(i=0;i<n/2;i++)
{
fprintf(match,"%s %d-%d %s\n",gen[i].name,gen[i].goals,gen[n-1-i].goals,gen[n-1-i].name);
}
fclose(match);

SetColor(13);

printf("\nThe matches have been recorded.\nYou can check the recorded matches by opening the
text file matches.txt\n");

SetColor(14);

printf("\nPress any key to continue.\n");

SetColor(15);

e=getch();

if(l%2!=0&&l!=legs-1)

{
for(i=0;i<n/2;i++)

{
swap=gen[i];
gen[i]=gen[n-1-i];
gen[n-1-i]=swap;
}
}

```

```

}

}

lt=fopen("latter stage teams.txt","wb");

for(i=0;i<n;i++)
{
    fwrite(&gen[i],sizeof(struct general),1,lt);
}

fclose(lt);

SetColor(10);

printf("\nData has been saved!\n");

SetColor(12);

printf("\nPress e to end the program.");

SetColor(14);

printf("\nPress any other key to continue\n");

SetColor(15);

e=getch();

if(e=='E' | | e=='e')
{
    lf=3;
    y=l+1;

    fprintf(lv,"%d\n%d\n%d\n%d\n%d\n%d",bye,y,n,x,mid,end,lf);

    fclose(lv);

    exit(0);
}
end=1;

system("CLS");

SetColor(11);

match=fopen("matches.txt","a");

```

```

printf("The aggregate scores are:\n");

fprintf(match,"The aggregate scores are:\n");

for(i=0;i<n/2;i++)
{
    printf("%s %d-%d %s\n",gen[i].name,gen[i].agg,gen[n-1-i].agg,gen[n-1-i].name);
    fprintf(match,"%s %d-%d %s\n",gen[i].name,gen[i].agg,gen[n-1-i].agg,gen[n-1-i].name);
}

fclose(match);

if(n/2!=1)

{
    printf("\nThe following teams have advanced to the next round:\n");
    for(i=0;i<n/2;i++)
    {
        SetColor(i%5+10);
        printf("%s\n",gen[i].name);
    }
}
n=n/2;
}

fclose(lv);

SetColor(15);

printf("\nCongratulations %s! You have won the %s.\n",gen[0].name,tnmt);

SetColor(14);

printf("\t\t\t @      @\n");
printf("\t\t\t@ #####@ @\n");
printf("\t\t\t@ ##### @\n");
printf("\t\t\t @ ##### @\n");
printf("\t\t\t @ #####@@\n");
printf("\t\t\t### \n");

```

```

printf("\t\t\t #\n");
printf("\t\t\t #\n");
printf("\t\t\t ###\n");
printf("\t\t\t ###\n");
SetColor(15);

}

void timer()
{
    int minute,second;
    SetColor(14);
    printf("Enter the Starting Minute: ");
    scanf("%d",&minute);
    SetColor(11);
    printf("Enter the Starting Second: ");
    scanf("%d",&second);
    showtime(minute ,second);
}

```

```

void showtime(int minute, int second)
{
    while(minute<100)
    {
        while(second<60)
        {
            Sleep(1000);
            system("CLS");
            second++;
            SetColor(14);
            display(minute/10,45,10);
        }
    }
}

```

```

display(minute%10,51,10);
SetColor(15);
colon(57,10);
SetColor(11);
display(second/10,63,10);
display(second%10,69,10);
}
minute++;
second=0;
}

}

```

```

void display(int digit, int x , int y)
{
switch(digit)
{
case 1:
    one(x,y);
    break;
case 2:
    two(x,y);
    break;
case 3:
    three(x,y);
    break;
case 4:
    four(x,y);
}

```

```

        break;

case 5:
    five(x,y);
    break;

case 6:
    six(x,y);
    break;

case 7:
    seven(x,y);
    break;

case 8:
    eight(x,y);
    break;

case 9:
    nine(x,y);
    break;

default:
    zero(x,y);
}

}

void gotoxy(int x,int y)
{
    COORD c;
    c.X=x;
    c.Y=y;
    SetConsoleCursorPosition(GetStdHandle(STD_OUTPUT_HANDLE),c);
}

void zero(int x ,int y)

```

```

{
    for(int i=1;i<=9;i++)
    {
        for(int j=1;j<=5;j++)
        {
            gotoxy(x,y);
            if(i==1 || i==9 || j==1 || j==5)
            {
                printf("0");
            }
            else
            {
                printf(" ");
            }
            x++;
        }
        y++;
        x=x-5;
        printf("\n");
    }
}

```

```

void one(int x,int y)
{
    for(int i=1;i<=9;i++)
    {
        for(int j=1;j<=5;j++)
        {
            gotoxy(x,y);

```

```

if(j==3)
{
    printf("1");
}
else
{
    printf(" ");
}
x++;
}

y++;
x=x-5;
printf("\n");
}

}

void two(int x,int y)
{
for(int i=1;i<=9;i++)
{
    for(int j=1;j<=5;j++)
    {
        gotoxy(x,y);
        if(i==1 || i==5 || i==9 || (i<5&&j==5) || (j==1&&i>5))
        {
            printf("2");
        }
        else
        {
            printf(" ");
        }
    }
}

```

```

        }
        x++;
    }
    y++;
    x=x-5;
    printf("\n");
}
}

void three(int x,int y)
{
    for(int i=1;i<=9;i++)
    {
        for(int j=1;j<=5;j++)
        {
            gotoxy(x,y);
            if(i==1 || i==5 || i==9 || j==5)
            {
                printf("3");
            }
            else
            {
                printf(" ");
            }
            x++;
        }
        y++;
        x=x-5;
        printf("\n");
    }
}

```

```

}

void four(int x,int y)
{
    for(int i=1;i<=9;i++)
    {
        for(int j=1;j<=5;j++)
        {
            gotoxy(x,y);
            if(j==5 || i==5 || (j==1&&i<5))
            {
                printf("4");
            }
            else
            {
                printf(" ");
            }
            x++;
        }
        y++;
        x=x-5;
        printf("\n");
    }
}

```

```

void five(int x,int y)
{
    for(int i=1;i<=9;i++)
    {
        for(int j=1;j<=5;j++)

```

```

{
    gotoxy(x,y);

    if(i==1 || i==5 || i==9 || (i>5&&j==5) || (j==1&&i<5))

    {
        printf("5");

    }

    else

    {
        printf(" ");

    }

    x++;

}

y++;

x=x-5;

printf("\n");

}

}

void six(int x,int y)

{
    for(int i=1;i<=9;i++)

    {
        for(int j=1;j<=5;j++)

        {
            gotoxy(x,y);

            if(i==1 || i==5 || i==9 || j==1 || (j==5&&i>5))

            {
                printf("6");

            }

            else

```

```

{
    printf(" ");
}
x++;
}
printf("\n");
y++;
x=x-5;
}

}

void seven(int x,int y)
{
    for(int i=1;i<=9;i++)
    {
        for(int j=1;j<=5;j++)
        {
            gotoxy(x,y);
            if(i==1 || j==5)
            {
                printf("7");
            }
            else
            {
                printf(" ");
            }
            x++;
        }
        y++;
        x=x-5;
    }
}

```

```

    printf("\n");
}

}

void eight(int x,int y)
{
    for(int i=1;i<=9;i++)
    {
        for(int j=1;j<=5;j++)
        {
            gotoxy(x,y);
            if(i==1 || i==5 || i==9 || j==1 || j==5)
            {
                printf("8");
            }
            else
            {
                printf(" ");
            }
            x++;
        }
        y++;
        x=x-5;
        printf("\n");
    }
}

void nine(int x,int y)
{
    for(int i=1;i<=9;i++)
    {

```

```

for(int j=1;j<=5;j++)
{
    gotoxy(x,y);
    if(i==1 || i==5 || i==9 || j==5 ||(j==1&&i<5))
    {
        printf("9");
    }
    else
    {
        printf(" ");
    }
    x++;
}
y++;
x=x-5;
printf("\n");
}

void colon(int x,int y)
{
    for(int i=1;i<=9;i++)
    {
        for(int j=1;j<=5;j++)
        {
            gotoxy(x,y);
            if((i==3&&j==3) || (j==3&&i==7))
            {
                printf("#");
            }
        }
    }
}

```

```

        else
        {
            printf(" ");
        }
        x++;
    }

    y++;
    x=x-5;
    printf("\n");
}

}

void SetColor(int ForgC)
{
    WORD wColor;

    HANDLE hStdOut= GetStdHandle(STD_OUTPUT_HANDLE);

    CONSOLE_SCREEN_BUFFER_INFO csbi;
    if(GetConsoleScreenBufferInfo(hStdOut, &csbi))
    {
        wColor = (csbi.wAttributes & 0xF0) + (ForgC & 0x0F);
        SetConsoleTextAttribute(hStdOut, wColor);
    }
}
}

void characterO(int x,int y)
{
    for(int i=1;i<=5;i++)
    {
        for(int j=1;j<=5;j++)

```

```

{
    gotoxy(x,y);
    if(i==1 || i==5 || j==5 || j==1)
    {
        printf("#");
    }
    else
    {
        printf(" ");
    }
    x++;
}
y++;
x=x-5;
printf("\n");
}

void characterC(int x,int y)
{
    for(int i=1;i<=5;i++)
    {
        for(int j=1;j<=5;j++)
        {
            gotoxy(x,y);
            if(i==1 || i==5 || j==1)
            {
                printf("#");
            }
            else

```

```

{
    printf(" ");
}
x++;
}
y++;
x=x-5;
printf("\n");
}

}

void characterS(int x, int y)

{
    for(int i=1;i<=5;i++)
    {
        for(int j=1;j<=5;j++)
        {
            gotoxy(x,y);
            if(i==1 || i==3 || i==5 || (i>3&&j==5) || (j==1&&i<3))
            {
                printf("#");
            }
            else
            {
                printf(" ");
            }
            x++;
        }
        y++;
    }
}

```

```

x=x-5;
printf("\n");
}

}

void characterU(int x, int y)

{

for(int i=1;i<=5;i++)
{
    for(int j=1;j<=5;j++)
    {
        gotoxy(x,y);
        if( i==5 || j==5 || j==1)
        {
            printf("#");
        }
        else
        {
            printf(" ");
        }
        x++;
    }
    y++;
    x=x-5;
    printf("\n");
}
}

void characterT(int x, int y)

```

```

{
    for(int i=1;i<=5;i++)
    {
        for(int j=1;j<=5;j++)
        {
            gotoxy(x,y);
            if(i==1 || j==3 )
            {
                printf("#");
            }
            else
            {
                printf(" ");
            }
            x++;
        }
        y++;
        x=x-5;
        printf("\n");
    }
}

void characterM(int x, int y)

{
    for(int i=1;i<=5;i++)
    {
        for(int j=1;j<=7;j++)
        {
            gotoxy(x,y);

```

```

if(i==1 || j==1 || j==4 || j==7)
{
    printf("#");
}
else
{
    printf(" ");
}
x++;
}
y++;
x=x-7;
printf("\n");
}

```

void characterF(int x, int y)

```

{
    for(int i=1;i<=5;i++)
    {
        for(int j=1;j<=5;j++)
        {
            gotoxy(x,y);
            if(i==1 || i==3 || j==1)
            {
                printf("#");
            }
            else
            {

```

```

    printf(" ");
}
x++;
}
y++;
x=x-5;
printf("\n");
}

void characterB(int x, int y)

{
for(int i=1;i<=5;i++)
{
    for(int j=1;j<=5;j++)
    {
        gotoxy(x,y);
        if(i==1 || i==3 || i==5 || j==1 || j==5)
        {
            printf("#");
        }
        else
        {
            printf(" ");
        }
        x++;
    }
    y++;
    x=x-5;
}

```

```

    printf("\n");
}

}

void characterA(int x, int y)

{

    for(int i=1;i<=5;i++)
    {
        for(int j=1;j<=5;j++)
        {
            gotoxy(x,y);
            if(i==1 || i==3 || j==5 || j==1)
            {
                printf("#");
            }
            else
            {
                printf(" ");
            }
            x++;
        }
        y++;
        x=x-5;
        printf("\n");
    }
}

void characterL(int x, int y)

{

```

```

for(int i=1;i<=5;i++)
{
    for(int j=1;j<=5;j++)
    {
        gotoxy(x,y);
        if(j==1 || i==5)
        {
            printf("#");
        }
        else
        {
            printf(" ");
        }
        x++;
    }
    y++;
    x=x-5;
    printf("\n");
}
}

void characterR(int x, int y)

{
    for(int i=1;i<=5;i++)
    {
        for(int j=1;j<=5;j++)
        {
            gotoxy(x,y);
            if(i==1 || i==3 || j==1 || (i==4&&j==3) || (j==5&&i<3) || (i==5&&j>3))

```

```

{
    printf("#");
}
else
{
    printf(" ");
}
x++;
}
y++;
x=x-5;
printf("\n");
}
}

void characterN(int x, int y)

```

```

{
for(int i=1;i<=5;i++)
{
    for(int j=1;j<=5;j++)
    {
        gotoxy(x,y);
        if(i==1 || j==5 || j==1)
        {
            printf("#");
        }
        else
        {
            printf(" ");
        }
    }
}

```

```

    }
    x++;
}
y++;
x=x-5;
printf("\n");
}

void characterE(int x, int y)

{
    for(int i=1;i<=5;i++)
    {
        for(int j=1;j<=5;j++)
        {
            gotoxy(x,y);
            if(i==1 || i==3 || i==5 || j==1)
            {
                printf("#");
            }
            else
            {
                printf(" ");
            }
            x++;
        }
        y++;
        x=x-5;
        printf("\n");
    }
}

```

}

}