Algoritmia e Programação

Practical Work (2019-2020)

Statement

It is intended to deal with the information of a world football championship. The group stage has already taken place, and the teams of each group have played with each other.

Part of the existing information is stored in a text file (PracticalWork_EN.csv) with the following structure: **`Group,Team,Played,Won,Drawn,Lost,GoalsFor,GoalsAgainst`**

Example:

```
A,Uruguai,3,3,0,0,5,0
B,Portugal,3,1,2,0,5,4
```

Played is the number of games played with other teams. Won, Drawn, and Lost are the number of wins, draws and losses in these games, respectively.

In order to meet the requirements of this work, use modularization and arrays and implement a menu-driven Java program (describing the requested points) to enable:

1. Read the information available in the text file (PracticalWork_EN.csv) and store it in memory (avoid global variables);
2. Enter team information manually (B, Portugal, 3,1,2,0,5,4). Do not allow teams with the same name;
3. Calculate and store in memory the points of all teams. The points of a team is calculated by the following formula: Points = Won * 3 + Drawn * 1;
4. Calculate and store in memory the position of all teams in their groups. The position is obtained by descending order of the following criteria, in order of importance: (1) points; (2) GoalsFor; (3) fewer GoalsAgainst; (4) team name (in ascending alphabetical order);
5. List the position of each team by group;
6. List teams whose GoalsFor equals the maximum of GoalsFor;
7. List teams having a specified number of GoalsAgainst (entered by user);
8. List teams having more GoalsAgainst than GoalsFor, sorted alphabetically;
9. List team in first position of each group;
10. List full team information (defined by user);
11. Create a text file (Statistics.txt) with game statistics, respecting the following content:

```
Total games =
Total wins =
Total draws =
Total losses =
Total Goals For=
Total Goals Against=
Average of Goals Scored per Game = (1 decimal place)
Average of conceded goals per game = (1 decimal place)
```

12. Remove from memory teams that will not play in the next phase (3rd and 4th positions of each group);

13. Create a text file (FinalStage.csv) with information of the teams that will play in the next phase of the championship, with the following content per line:

    `<Group>,<Position>,<Team>,<Points>`

14. Create a text file (FinalStageGames.txt) with information about the final games. Games will be played as follows:

    GroupA 1º - GroupB 2º;
    GroupA 2º - GroupB 1º;
    GroupC 1º - GroupD 2º;
    GroupC 2º - GroupD 1º;
    …
    The text file must comply with the following contents:
    `<Group>,<Position>,<Team> - <Group>,<Position>,<Team>`

NOTE: All listings must be properly formatted, and column values aligned vertically (numbers on the right and text on the left) as follows:

```
| Grp | Pos | Team              | Pts|Plyd| W  | D  | L  | GF | GA |Gdif|
|=====|=====|===================|====|====|====|====|====|====|====|====|
|--5--|--5--|-------------17----|-4--|-4--|-4--|-4--|-4--|-4--|-4--|-4--|
…
```

Exemplo:

```
| Grp | Pos | Team              | Pts|Plyd| W  | D  | L  | GF | GA |Gdif|
|=====|=====|===================|====|====|====|====|====|====|====|====|
|B    |    2|Portugal           |   5|   3|   1|   2|   0|   5|   4|   1|
```

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Rules:

- The work should be done in groups of two students. You must communicate by email to the PL class teacher by the end of the 9th week of APROG the constitution of the group;
- The work must be submitted by all students to Moodle by 11:30 pm on December 1, 2019. From this date, the grade will be penalized 10% for each day of delay and no work will be accepted after two days of delay;
- After delivery, in the following practical classes, each group will have to defend the submitted work, with the teacher, for evaluation;
- The submission in moodle must be a ZIP file containing the entire project structure and necessary files for its operation. The ZIP file name must conform to the following standard: **"APROG_DEI_ <class> _ <student # 1> _ <student # 2>";**

  Example: "APROG_DEI_DA_11223344_55667788"
- Who does not defend the work will not be evaluated.