Cairo University
Faculty of Computers & Artificial Intelligence
Department of Computer Science
Artificial Intelligence Course

Assignment 1

Problem Statement

Given the league_data.pl file, you are required to write a prolog problem that answers some questions about a football league, the matches played in the league, players info, how many times a specific team won the league.

Facts (league_data.pl file):

You **must** use this data file in your assignment. You are given some facts about matches and players. For Example:

- **Team(Name, Country, Num_of_winning_times)**
  team(barcelona, spain, 5).
  Means that barcelona team is form Spain and it won the league 5 times
- **Player(Name, Team, Position)**
  player(messi, barcelona, forward).
  Means that Messi plays in barcelona in the forward position
- **Match(Team1, Team2, Team1Goals, Team2Goals)**
  match(barcelona, real_madrid, 3, 2).
  Means barcelona team played a match vs real_madrid, and the final score was 3:2.
- **Goals(Player, Num_of_scored_goals)**
  goals(messi, 10)
  Means that Messi scored 10 goals in the league

Required Predicates:

TASK 1 [0.75 mark]: Get a list of all players in a specific team
?- players_in_team(barcelona, L). L = [messi, ter_stegen, de_jong].

TASK 2 [0.75 mark]: Count how many teams are from a specific country
?- team_count_by_country(spain, N). N = 2.

TASK 3 [1 mark]: Find the team with the most championship titles
?- most_successful_team(T). T = bayern_munich.

TASK 4 [1 mark]: List all matches where a specific team participated
?- matches_of_team(barcelona, L). L = [(barcelona, real_madrid, 3, 2), (liverpool, barcelona, 2, 2)].

TASK 5 [0.25 mark]: count all matches where a specific team participated
?- num_matches_of_team(barcelona, N). N = 2.

TASK 6 [0.75 mark]: Find the top goal scorer in the tournament
?- top_scorer(P). P = ronaldo.

TASK 7: [1.5 mark] Find the Most Common Position in a Specific Team
?- most_common_position_in_team(barcelona, Pos). Pos = forward.

Bonus Task [0.5 mark]: Control Unneeded backtracking in all predicates
Sometimes if we force prolog to retrieve more answers by the ";" operator, it gives us unneeded and/or incorrect answers. You are required to avoid this and force prolog to give exactly one answer if no more answers exist. **Example:** **?- team_count_by_country(spain,Count).** Count = 2 ; %the only correct answer Count = 1 ; %wrong answer Count = 2 ; %unneeded backtracking Count = 1 ; %wrong answer Count = 0. %wrong answer **After the required refactoring, it should act like this:** **?- team_count_by_country(spain,Count).** Count = 2.

Important Notes

Please read these notes carefully to avoid losing grades

- Don't change the structure of "league_data.pl".
- Include "league_data.pl" in your source code by writing this line in the beginning of your source code make sure to place "league_data.pl" in same location of your source code

```
:-consult(league_data).
```

- **Don't use any built-in predicates.** But you can use the predicates developed in the lists lab like member, list_count, append, …)
- The number of students in a team is **2 -3 students** from the **same lab group** or with the same TA.
- Please make sure that the load is almost equally distributed between team members.

- Please submit one .pl file containing your solution. The file name must follow this structure:
    - For General Students **Gen_ID1_ID2_ID3_ID4 _GROUP_LAB_TA.pl**
    - For Special Students **SP_ID1_ID2_ID3_ID4 _GROUP_LAB_TA.pl**
    - **Note that: any violation in the assignment submission will cost you 0.5 mark of the assignment grade (like submitting more than one file, not following the naming convention, using different file extension)**
- **Cheaters will be given a NEGATIVE grade and no excuses will be accepted.**