CSC343 Term Project - Investigative Questions

Q1.

Scenario: A FIFA professional gamer wants to build a team of players to attend a FIFA game competition. He has his own style of playing and prefers a formation of three attackers. He wants to find the best player in each position in the formation according to his play style. He also needs to consider chemistry[1] between players as restricted by the game rules.

Question: Find the formations with 3 attackers, then from the list of formations, pick a most desired one. Find the best lineup with the following requirements: all the 11 players can speak English at the same time. All players must have ratings over 75.

Q2.

Scenario: Real world soccer clubs always want to sign good players at low cost, however, not all the clubs have enough financial resources to sign the best players in the world. Most clubs are considering "price_performance_ratio" when signing players, where they are trying to find and sign the players who have strong soccer skills, but have not been recognized by the markets (means that their value on paper is not high on transfer markets). It happens in FIFA games as well, where gamers trying to identify some players with high ratings and not popular enough, so that the amount they need to spend to purchase that player in game is relatively low.

Question: A club's coach is running the 4-3-3 formation in his team, he is trying to sign 11 low "price_performance_ratio" players to play for the club. In this case, we define our price_performance_ratio to be the player's value divided by the player's overall rating. If a player has a lower price_performance_ratio, it means this player is better. Find the lowest price_performance_ratio lineup for 4-3-3 formation while maintaining all the player's ratings above 80.

Q3.

Scenario: Nowadays, Soccer leagues around the world are opening their policy of introducing foreign players into the clubs. This enhances clubs' diversity and overall performance, and gives clubs much more choices on the pitch positions. However, players from different countries or cultural backgrounds may have problems communicating with each other, which is an especially prominent problem in the backline[2] of a team.

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[1] Chemistry: In FIFA games, players in the formation should speak the same language or have the same nationality, otherwise their ability in game will be dropped.This mechanism is to simulate real-world players' dynamics.

[2] Backline: The group of players in a soccer team that handles defensive work. They communicate most often to strategically tackle opponent's attacking.

Question: Find all clubs that: The overall highest rated goalkeeper of the club shares language with all top three defenders of the club (the best goalkeeper usually starts a match with top defenders in the team). That is, between the goalkeeper and each of the three defenders, they have at least one language in common. Report the number of clubs with good communication and number of total clubs.