DS 210 Final Project Report

For my project, I use the dataset by the following link "https://www.kaggle.com/datasets/noahgift/social-power-nba" in kaggle.com. I combined two csv together and then collected the necessary data such as "player name", "team name", "Assists number", "Salary in millions", and Twitter favorite count". We are going to use them to find the average distance, closeness centrality, and players with similar pairs.

Average distance

Average Euclidean Distance: According to the command output, the average distance between players is based on their salary in millions and their Twitter favorite count, I get the average distance is 5.00.

The smallest distance observed between any two players shows the closest pair regarding salary and Twitter favorites. The players in this pair have the most similar salary and Twitter favorite count. The largest distance observed shows the pair of players that are the most different from each other in terms of salary and Twitter favorites.

The shortest distance recorded is 0, which we observed multiple times, one of the distances recorded is 0 is between Russell Westbrook and Kevin Durant.

The longest distance found is 21, between Georgios Papagiannis and Vince Carter. This shows a dissimilarity or difference between these two players concerning the attributes measured.

As a result of this output, we could analyze that if Russell Westbrook and Kevin Durant are not on the same team, and both team manager wants to trade them, their trade value is the same, there is no need to add more first-round picks or pay more salary to make the exchange successful.

Closeness Centrality

"There are 30 connected components" means that the graph consists of 30 different groups of nodes (players), where each group is connected internally, but there are no connections between different groups. This indicates that players are grouped by team because there are 30 teams in the NBA.

"Top 20 Closeness Centrality" means that these are the top 20 players with the highest closeness centrality values. For example, "Node James Harden: Closeness Centrality = 59.2500" means that James Harden is the core player in his component, which means that he can quickly connect to other players in his network component. In other words, James Harden may be the leader or captain of this team. The tactics the coach arranges for other players on the team are all based on how James Harden successfully scores. James Harden is also the key player and cornerstone of this team.

Players with similar pair

I use petgraph to construct the graph, Edge is the "similar assists", node is the "player", and the difference between two players in Top 20 Closeness Centrality with assists number below 5 or less, I mark them as similar assists. and combine them as a pair. Their relationships

are undirected, meaning the relationship doesn't have a direction or order. The assists similarity is the same regardless of which player is considered first.

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Distance between Brandon Rush and Andrew Nicholson is 4
Distance between Brandon Rush and Jared Sullinger is 6
Distance between Brandon Rush and Greivis Vasquez is 1
Distance between Brandon Rush and Alonzo Gee is 1
Distance between Brandon Rush and Lamar Patterson is 6
Distance between Cameron Payne and Miles Plumlee is 6
Distance between Cameron Payne and Dragan Bender is 3
Distance between Cameron Payne and Andrew Nicholson is 5
Distance between Cameron Payne and Jared Sullinger is 3
Distance between Cameron Payne and Greivis Vasquez is 8
Distance between Cameron Payne and Alonzo Gee is 8
Distance between Cameron Payne and Lamar Patterson is 3
Distance between Miles Plumlee and Dragan Bender is 9
Distance between Miles Plumlee and Andrew Nicholson is 1
Distance between Miles Plumlee and Jared Sullinger is 3
Distance between Miles Plumlee and Greivis Vasquez is 2
Distance between Miles Plumlee and Alonzo Gee is 2
Distance between Miles Plumlee and Lamar Patterson is 3
Distance between Dragan Bender and Andrew Nicholson is 8
Distance between Dragan Bender and Jared Sullinger is 6
Distance between Dragan Bender and Greivis Vasquez is 11
Distance between Dragan Bender and Alonzo Gee is 11
Distance between Dragan Bender and Lamar Patterson is 6
Distance between Andrew Nicholson and Jared Sullinger is 2
Distance between Andrew Nicholson and Greivis Vasquez is 3
Distance between Andrew Nicholson and Alonzo Gee is 3
Distance between Andrew Nicholson and Lamar Patterson is 2
Distance between Jared Sullinger and Greivis Vasquez is 5
Distance between Jared Sullinger and Alonzo Gee is 5
Distance between Jared Sullinger and Lamar Patterson is 0
Distance between Greivis Vasquez and Alonzo Gee is 0
Distance between Greivis Vasquez and Lamar Patterson is 5
Distance between Alonzo Gee and Lamar Patterson is 5
The average euclidean distance is : 5.002144790970782
The shortest distance of two players is between Russell Westbrook and Kevin Durant at 0
The longest distance of two players is between Georgios Papagiannis and Vince Carter at 21
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There are 30 connected components
Top 20 Closeness Centralities:
Node Reggie Bullock: Closeness Centrality = 47.4000
Node Marcus Morris: Closeness Centrality = 47.4000
Node Jamal Crawford: Closeness Centrality = 47.4000
Node Kentavious Caldwell-Pope: Closeness Centrality = 47.4000
Node Henry Ellenson: Closeness Centrality = 47.4000
Node Gerald Henderson: Closeness Centrality = 47.4000
Node Austin Rivers: Closeness Centrality = 47.4000
Node Nik Stauskas: Closeness Centrality = 47.4000
Node Stanley Johnson: Closeness Centrality = 47.4000
Node Paul Pierce: Closeness Centrality = 47.4000
Node James Harden: Closeness Centrality = 59.2500
Node J.J. Barea: Closeness Centrality = 59.2500
Node Nerlens Noel: Closeness Centrality = 59.2500
Node Dirk Nowitzki: Closeness Centrality = 59.2500
Node Dwight Powell: Closeness Centrality = 59.2500
Node Sam Dekker: Closeness Centrality = 59.2500
Node Trevor Ariza: Closeness Centrality = 59.2500
Node Eric Gordon: Closeness Centrality = 59.2500
Node Troy Williams: Closeness Centrality = 59.2500
Node DeAndre Liggins: Closeness Centrality = 59.2500
Last 20 Closeness Centralities:
Node Nikola Jokic: Closeness Centrality = 23.7000
Node Jimmy Butler: Closeness Centrality = 23.7000
Node Al Horford: Closeness Centrality = 23.7000
Node Kenneth Faried: Closeness Centrality = 23.7000
Node Dwyane Wade: Closeness Centrality = 23.7000
Node Danilo Gallinari: Closeness Centrality = 23.7000
Node Kelly Olynyk: Closeness Centrality = 23.7000
Node Bobby Portis: Closeness Centrality = 23.7000
Node Rajon Rondo: Closeness Centrality = 23.7000
Node Nikola Mirotic: Closeness Centrality = 23.7000
Node Jae Crowder: Closeness Centrality = 23.7000
Node Will Barton: Closeness Centrality = 23.7000
Node Wilson Chandler: Closeness Centrality = 23.7000
Node Gary Harris: Closeness Centrality = 23.7000
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Kentavious Caldwell-Pope (DET) and Nik Stauskas (PHI) have similar assists.
Kentavious Caldwell-Pope (DET) and Austin Rivers (LAC) have similar assists.
Kentavious Caldwell-Pope (DET) and Gerald Henderson (PHI) have similar assists.
Kentavious Caldwell-Pope (DET) and Henry Ellenson (DET) have similar assists.
Kentavious Caldwell-Pope (DET) and Henry Ellenson (DET) have similar assists.
Henry Ellenson (DET) and Paul Pierce (LAC) have similar assists.
Henry Ellenson (DET) and DeAndre Liggins (DAL) have similar assists.
Henry Ellenson (DET) and Stanley Johnson (DET) have similar assists.
Henry Ellenson (DET) and Stanley Johnson (DET) have similar assists.
Henry Ellenson (DET) and Troy Williams (HOU) have similar assists.
Henry Ellenson (DET) and Nik Stauskas (PHI) have similar assists.
Henry Ellenson (DET) and Austin Rivers (LAC) have similar assists.
Henry Ellenson (DET) and Gerald Henderson (PHI) have similar assists.
Gerald Henderson (PHI) and Paul Pierce (LAC) have similar assists.
Gerald Henderson (PHI) and DeAndre Liggins (DAL) have similar assists.
Gerald Henderson (PHI) and Stanley Johnson (DET) have similar assists.
Gerald Henderson (PHI) and Troy Williams (HOU) have similar assists.
Gerald Henderson (PHI) and Nik Stauskas (PHI) have similar assists.
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Gerald Henderson (PHI) and Austin Rivers (LAC) have similar assists.
Austin Rivers (LAC) and Paul Pierce (LAC) have similar assists.
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Austin Rivers (LAC) and DeAndre Liggins (DAL) have similar assists.
Austin Rivers (LAC) and Stanley Johnson (DET) have similar assists.
Austin Rivers (LAC) and Troy Williams (HOU) have similar assists.
Austin Rivers (LAC) and Nik Stauskas (PHI) have similar assists.
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Nik Stauskas (PHI) and DeAndre Liggins (DAL) have similar assists.
Nik Stauskas (PHI) and Stanley Johnson (DET) have similar assists.
Nik Stauskas (PHI) and Troy Williams (HOU) have similar assists.
Troy Williams (HOU) and Paul Pierce (LAC) have similar assists.
Troy Williams (HOU) and DeAndre Liggins (DAL) have similar assists.
Troy Williams (HOU) and Stanley Johnson (DET) have similar assists.
Stanley Johnson (DET) and Paul Pierce (LAC) have similar assists.
Stanley Johnson (DET) and DeAndre Liggins (DAL) have similar assists.
DeAndre Liggins (DAL) and Paul Pierce (LAC) have similar assists.