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Professor Chator

DS210

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<div align="center">**DS210 Final Project Write-Up**</div>

<u>What My Project Does:</u>

For this project, I analyzed a dataset from Kaggle, titled, "NBA Stats (1947 - Present)" (can be found on the following URL: https://www.kaggle.com/datasets/sumitrodatta/nba-aba-baa-stats). My project utilizes various graphical algorithms, such as betweenness and closeness centrality, in order to analyze the relationships between player performance/shooting (nodes) and team statistics (nodes). From there, a correlation was found as to what statistic impacts a team's playoff chances the most. Edges are present between these nodes to construct centrality analyses. Additionally, my project uses the statistics in an analytic-manner, by looking at specific players (in this case, one player from each team in 2022) and seeing where their statistics matched up against the team's averages in that same area. This would tell how effective that player is. In general, the data is first loaded and filtered from the CSV files present, and then analytical and graphical methods are utilized to make conclusions about how player shooting statistics affect the success rate of a team, including how much that player really contributes to that team and their efficiency individually.

<u>How To Run The Project:</u>

Running the program is not that difficult at all; for me to make changes and edit into the main branch of the project, I cloned my repository and placed the dataset into my designated project
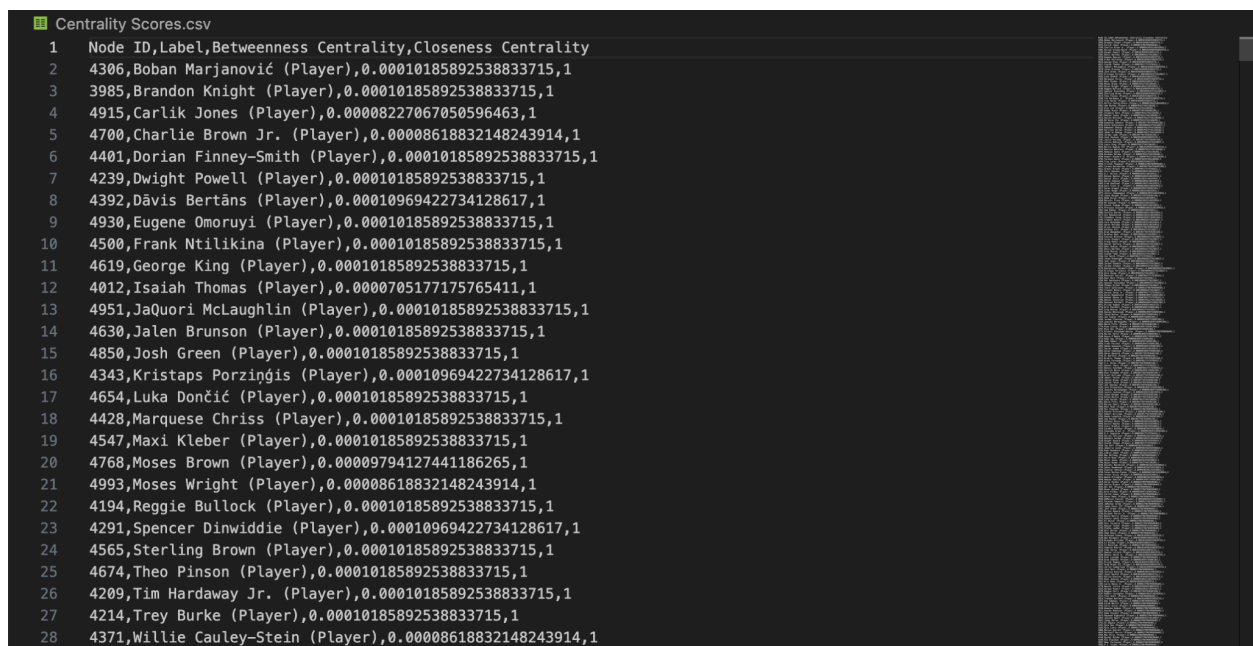
folder (including the copied repository folder, too). From there, all I needed to do was build the cargo file using "cargo build," and proceeded to run my program using "cargo run --release." The function "cargo test" was utilized to test the functionality of my different modules.

What My Output Looks Like:

Here are a few screenshots of the three CSV files my program outputted (excerpts of them):

Centrality Scores.csv:

Player Shooting Stats Analytics.csv:

```
Player Shooting Stats Analytics.csv
1    Player ID,Player Name,Team Name,Statistic Name,Correlation Coefficient
2    4475,Bogdan Bogdanović,Atlanta Hawks,FG Percent Diff,-0.03899999999999998
3    4475,Bogdan Bogdanović,Atlanta Hawks,FG Percent Ratio,0.9170212765957447
4    4475,Bogdan Bogdanović,Atlanta Hawks,FG Percent from 2P Range Diff,-0.015000000000000013
5    4475,Bogdan Bogdanović,Atlanta Hawks,FG Percent from 2P Range Ratio,0.9717514124293785
6    4475,Bogdan Bogdanović,Atlanta Hawks,FG Percent from 3P Range Diff,-0.006000000000000005
7    4475,Bogdan Bogdanović,Atlanta Hawks,FG Percent from 3P Range Ratio,0.9839572192513368
8    4805,Aaron Nesmith,Boston Celtics,FG Percent Diff,-0.07
9    4805,Aaron Nesmith,Boston Celtics,FG Percent Ratio,0.8497854077253219
10   4805,Aaron Nesmith,Boston Celtics,FG Percent from 2P Range Diff,0.06499999999999995
11   4805,Aaron Nesmith,Boston Celtics,FG Percent from 2P Range Ratio,1.1188299817184642
12   4805,Aaron Nesmith,Boston Celtics,FG Percent from 3P Range Diff,-0.08599999999999997
13   4805,Aaron Nesmith,Boston Celtics,FG Percent from 3P Range Ratio,0.7584269662921349
14   4064,Andre Drummond,Brooklyn Nets,FG Percent Diff,0.135
15   4064,Andre Drummond,Brooklyn Nets,FG Percent Ratio,1.2842105263157895
16   4064,Andre Drummond,Brooklyn Nets,FG Percent from 2P Range Diff,0.07499999999999996
17   4064,Andre Drummond,Brooklyn Nets,FG Percent from 2P Range Ratio,1.1394052044609664
18   4064,Andre Drummond,Brooklyn Nets,FG Percent from 3P Range Diff,-0.361
19   4064,Andre Drummond,Brooklyn Nets,FG Percent from 3P Range Ratio,0
20   4465,Alex Caruso,Chicago Bulls,FG Percent Diff,-0.08199999999999996
21   4465,Alex Caruso,Chicago Bulls,FG Percent Ratio,0.8291666666666667
22   4465,Alex Caruso,Chicago Bulls,FG Percent from 2P Range Diff,-0.07300000000000001
23   4465,Alex Caruso,Chicago Bulls,FG Percent from 2P Range Ratio,0.8635514018691589
24   4465,Alex Caruso,Chicago Bulls,FG Percent from 3P Range Diff,-0.035999999999999976
25   4465,Alex Caruso,Chicago Bulls,FG Percent from 3P Range Ratio,0.9024390243902439
26   4905,Arnoldas Kulboka,Charlotte Hornets,FG Percent Diff,-0.468
27   4905,Arnoldas Kulboka,Charlotte Hornets,FG Percent Ratio,0
28   4905,Arnoldas Kulboka,Charlotte Hornets,FG Percent from 2P Range Diff,-0.542
```

Players' Contribution To Team.csv:

```
Players' Contribution To Team.csv
1    Player ID,Player Name,Statistic Name,Correlation Coefficient
2    0,All Players,FG Percent,0.13016065337295707
3    0,All Players,FG Percent from 3P Range,0.033794041008999506
4    0,All Players,FG Percent from 2P Range,0.19450651375529768
5
```