

Assignment 3: Critical analysis

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Task 1:

Modifications Made:

- Used NetworkX to form a graph and examine links among directors and their companies.
- To choose which directors are the most influential, I calculated betweenness centrality.
- The top 10 directors were identified according to their centrality values.
- Incorporated a bar chart that shows the leading directors by their total earnings.

Rationale:

Between centrality identifies directors who connect different groups of authors. Such persons can control the exchange of information and teamwork.

Analytical Insight:

Those directors with the highest betweenness count may have a significant role in the company's activities. Sometimes, they handle relationships with different companies and have an impact on top-level choices.

Task 2:

Modifications Made:

The template code in the program was fixed for four main issues:

fix 1: Wrote notes in the code lines and in Markdown to highlight the code's explanations.

Added a column named "Software Background" for all directors who have a connection to software.

Fix 4: Made sure the connected components are selected by choosing the biggest one every time.

Fix 5: Use common ways to format names to stop them from causing errors when tables are joined.

Rationale:

All the solutions made the notebook perform more accurately, clearly, and correctly. It was important to have them for meaningful analysis using graphs.

Analytical Insight:

Bringing in normalizing names and finding directors with technical experience solved the data duplication problem and helped us study technical representation within the board network.

Task 3:

Modifications Made:

- added a feature named num_companies that identifies the number of diverse companies each director handled.
- combined the data in a single DataFrame named "people_df" and showed the highest entries.

Rationale:

More board positions that a director takes, the more authority and connections they tend to have. This aspect gives more helpful details when analyzing centrality and compensation.

Analytical Insight:

Connected directors are usually found to have greater centrality and better paid compensation. It came in handy for making interpretations of the clustering results.

Task 4:

Modification Made:

- DBSCAN clustering algorithm was used to arrange the directors into groups.
- Outliers in the features were addressed by using RobustScaler.
- The workers were divided by their age, log compensation, degree centrality, and eigenvector centrality.
- Showed outcomes using a scatter plot chart.

-For better understanding for anyone who gets to go through the notebook, I have added markdown explanations below.

Rationale:

DBSCAN helps locate clusters naturally with no set limit on the number of clusters. It helps with finding unusual data and grouping together similar ones.

Analytical Insights:

There are different groups that show the different kinds of directors, such as those who have average earnings, the most money, or just started out with less experience. It becomes easier to see patterns after visualizing the data.

Task 5:

Modifications Mode:

Refinement(a):

- Made the scatter plot more attractive by changing the size, color, and clarity.
- Any substantial difference in company sizes is measured by the number of companies.
- The data was represented using viridis color map for increased clarity in the visuals.

Rationale:

Using the revised plot, it is easy and direct to explain the business case to stakeholders.

Insight:

It is easier to group people based on their pay, age, and their connections to others. With large dots(more companies)on them, powerful directors could be easily spotted.

Refinement(b):

Modifications Made:

- Formed a table to show the average age, compensation, and centrality by cluster
- Represented the sizes of the clusters.

Rationale:

The summary helps compare clusters more effectively and explains what each group of directors represents.

Insight:

Cluster 0 can stand for general directors, while the smaller ones can suggest elites or outliers.