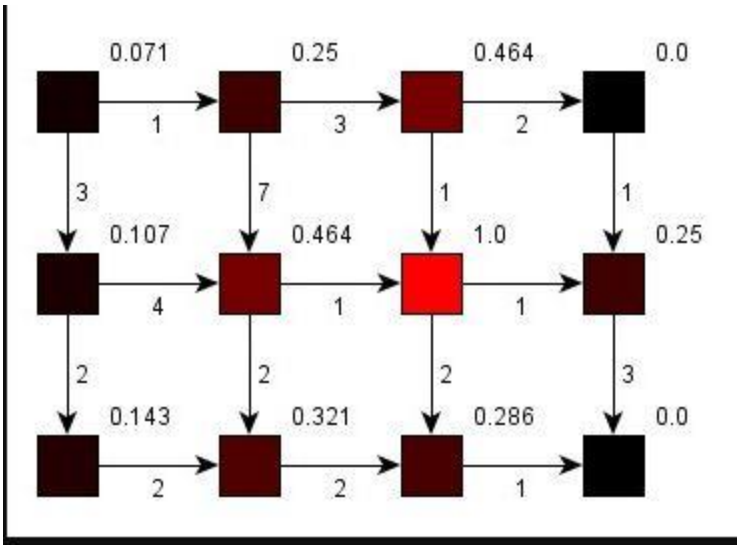
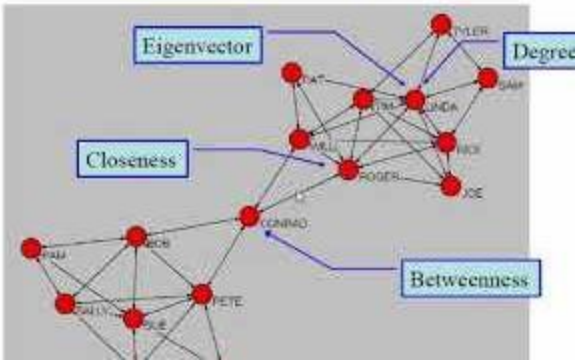
In this project, a sample dataset from the SNAP (Stanford Network Analysis Project) repository that contains a social network of a university is used to do data analysis. I used algorithms such as closeness and betweenness centralities to analyze the dataset. Closeness centrality measures the extent to which a vertex is close to all other vertices in a graph. Betweenness centrality measures the extent to which a vertex lies on short paths between other vertices. These algorithms will allow me to identify which vertices are most "central" to the graph and which subgraphs have the most influence. The goal of this project is to analyze a graph or graphs using Rust and to assess the centrality measures of the vertices in the graph. We will be looking at closeness and betweenness centralities as metrics to measure the importance of a vertex in the graph. By assessing these centrality measures, we will be able to identify important vertices in the graph and understand how they are connected. Additionally, we will explore meaningful subgraphs to analyze the centrality measures within those subgraphs and see if they align with our intuitions.

Once the graph has been created, centrality measures can be computed. Degree centrality can be computed by using the degree_centrality() function provided by either library. Betweenness centrality can be computed by using the betweenness_centrality() function, and closeness centrality can be computed by using the closeness_centrality() function. Finally, eigenvector centrality can be computed by using the eigenvector_centrality() function. After the centrality measures have been computed, the results can be visualized using a library such as Plotly or matplotlib. This will allow one to create a graph of the results, which can then be used to analyze the network.

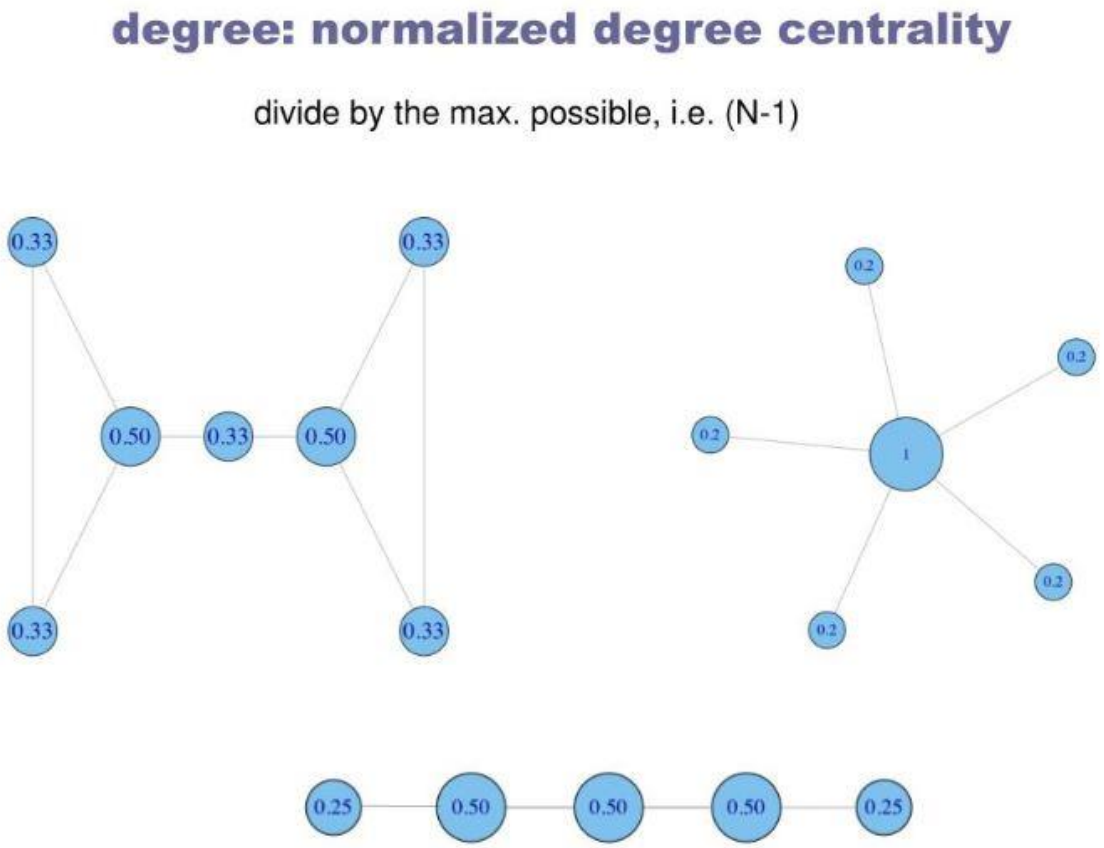


The highest vertices will be analyzed to determine whether they match the intuition of the user. Subgraphs will be examined to determine if the same is true for them. The results of this analysis will help to illustrate the relationship between the nodes within the graph and the overall structure of the graph. The centrality measures used in this project include degree centrality, closeness centrality, and betweenness centrality. These measures will be used to analyze the graph and to determine the most important nodes within it. The degree centrality measure will be used to determine the number of direct connections a node has with other nodes in the graph. The closeness centrality measure will be used to determine the average distance between a node and all other nodes in the graph. Finally, the betweenness centrality measure will be used to determine how much a node lies on the shortest path between other nodes in the graph. By examining the results of these centrality measures, the user will be able to gain a better understanding of the overall structure of the graph and the relationships between the nodes within it. This will help to inform further analysis of the graph and its subgraphs.



Centrality

The degree centrality measures the number of connections each node has. The betweenness centrality measures the number of times a node lies on the shortest path between two other nodes. The closeness centrality measures the average shortest path length between a node and all other nodes in the graph. These centrality measures can be used to identify the most important nodes in the graph and the most important paths.



These measures will provide insight into the importance of each node in the graph and the strength of relationships between nodes. The degree centrality will show the number of direct connections each node has, betweenness centrality will show the extent to which a node lies on paths between other nodes, and closeness centrality will show the average distance between a node and all other nodes in the graph. With these measurements, the relative importance of each node and the strength of relationships between nodes can be determined.

The comparison of the vertices to intuition will provide insight into the structure of the graph. The analysis of the centrality measures will allow for a better understanding of the

connections between the nodes. The results of this project will help to identify the most important nodes in the graph. This can be done by calculating various measures, such as degree centrality, closeness centrality, and betweenness centrality. The user should then compare the results of the centrality measures to their intuition about the important nodes in the graph. This will help them gain an understanding of the importance of each node in the graph, and inform decisions about the structure of the graph.

Analyzing the highest vertices according to the centrality measures in a graph using Rust. The graph consists of nodes (also known as vertices) connected by edges, which can be directed or undirected. Centrality measures will be computed to assess the importance of each of these nodes. The highest vertices according to the centrality measures will then be analyzed and compared to intuition.