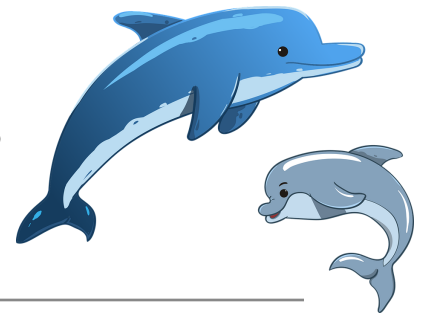# SOCIAL NETWORK ANALYSIS
Dolphin Social Network

INTRODUCTION

This dataset shows an undirected social network of frequent associations between 62 dolphins in a community living off Doubtful Sound, New Zealand.

Dataset Link

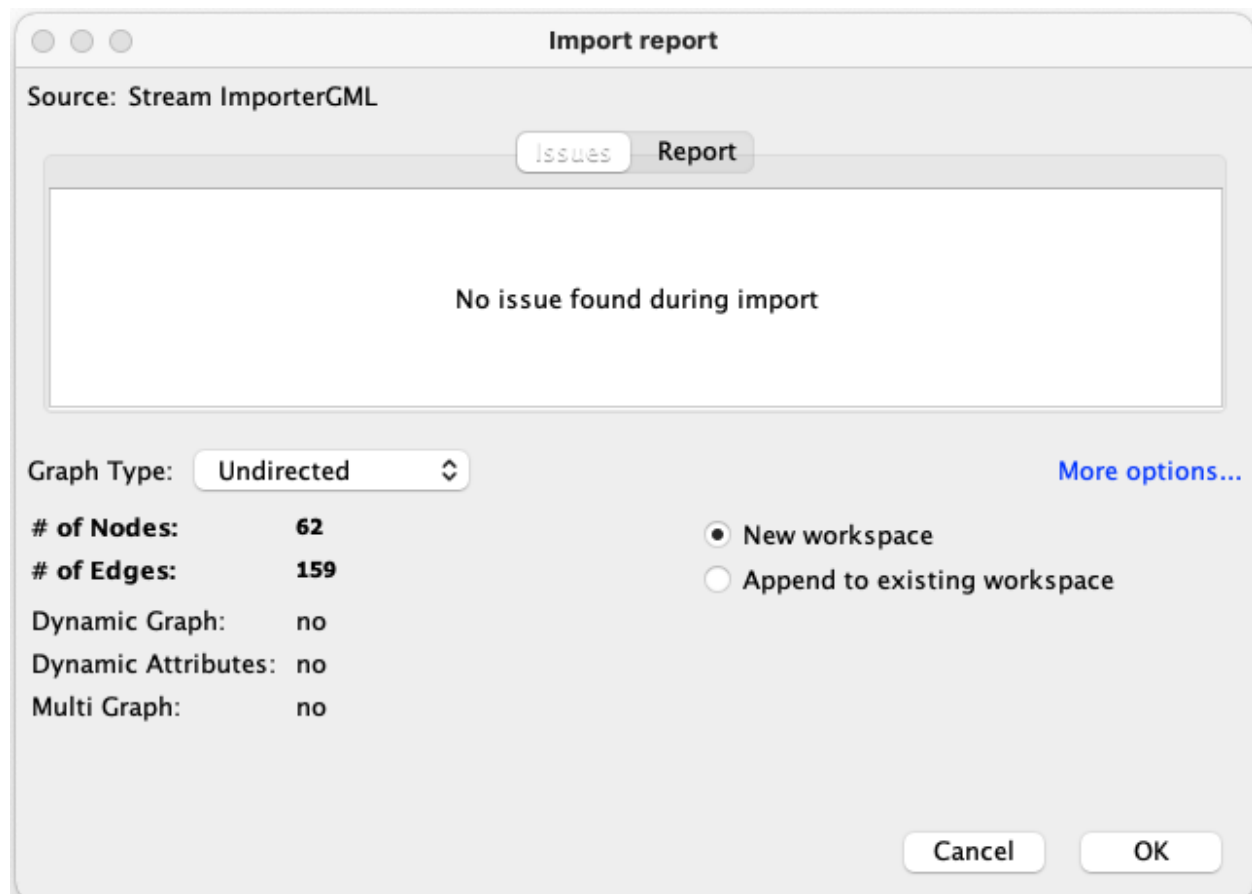Gephi software was used for the visualization and analysis of this dataset.

The following steps show the procedure followed for the analysis and interpretation.

Step 1:

The .gml file for the initial data cluster was imported into Gephi. The number of nodes and edges were mentioned in the following window.
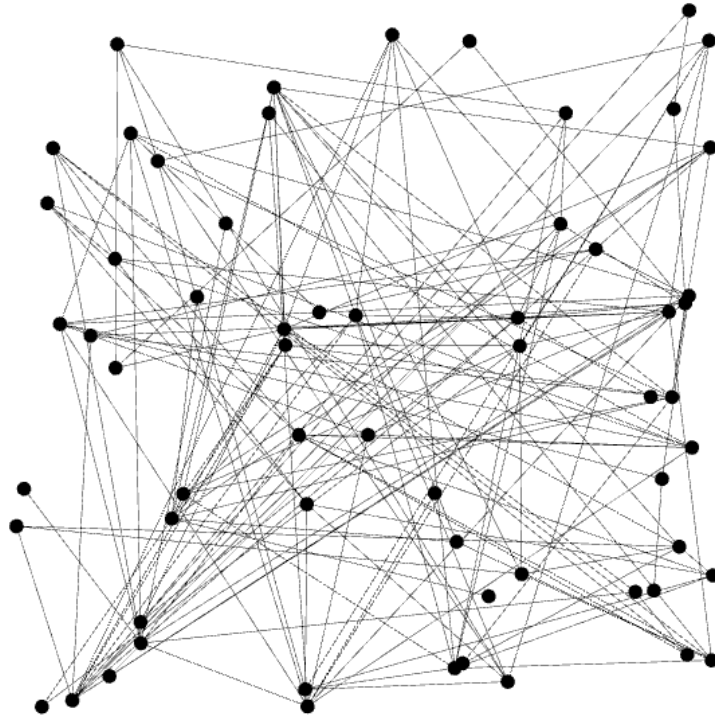
Number of Nodes- 62

Number of Edges - 159

Step 2 :

Initially, the data cluster looked like a square with multiple nodes and edges through which no interpretation and analysis could be done.

Step 3:

In order for the layout to make more sense and be interpretable, the layout of Force Atlas 2 was chosen with scaling 100 (to decide the repulsion) and prevent overlap, while leaving the other values as it is.
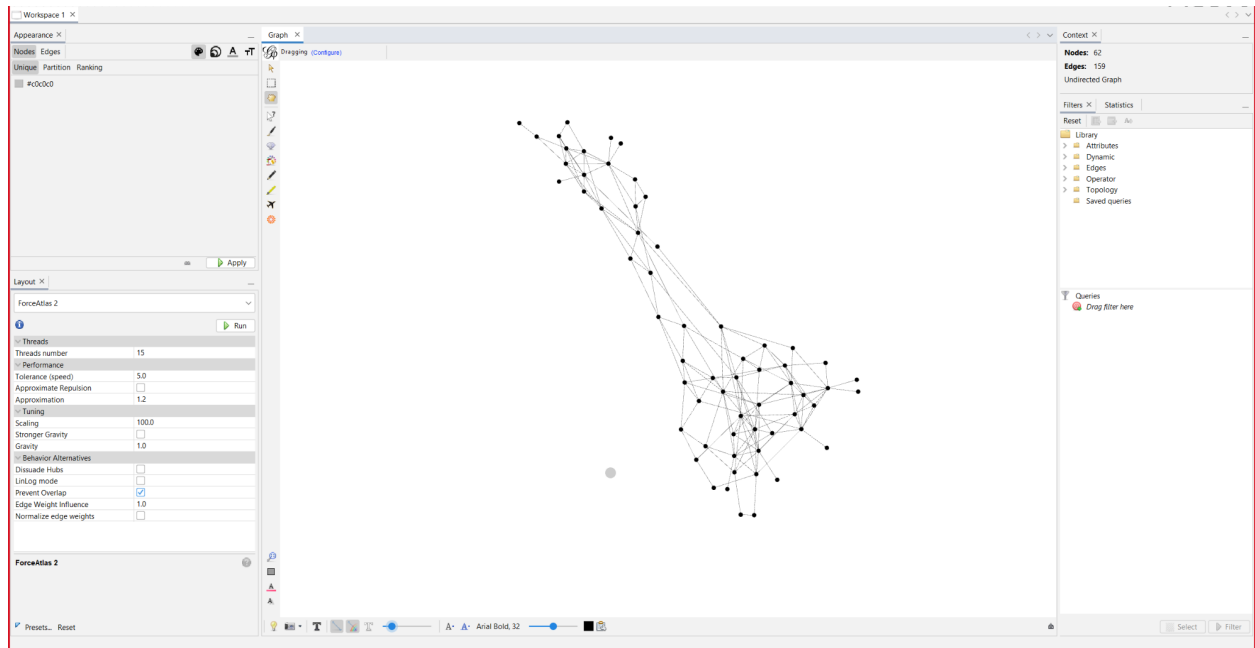
Step 4:

In this step, we changed the color of the cluster according to the degree of the nodes. The degree here refers to the connection.

Interpretation- Higher the degree, darker the shade of the nodes.
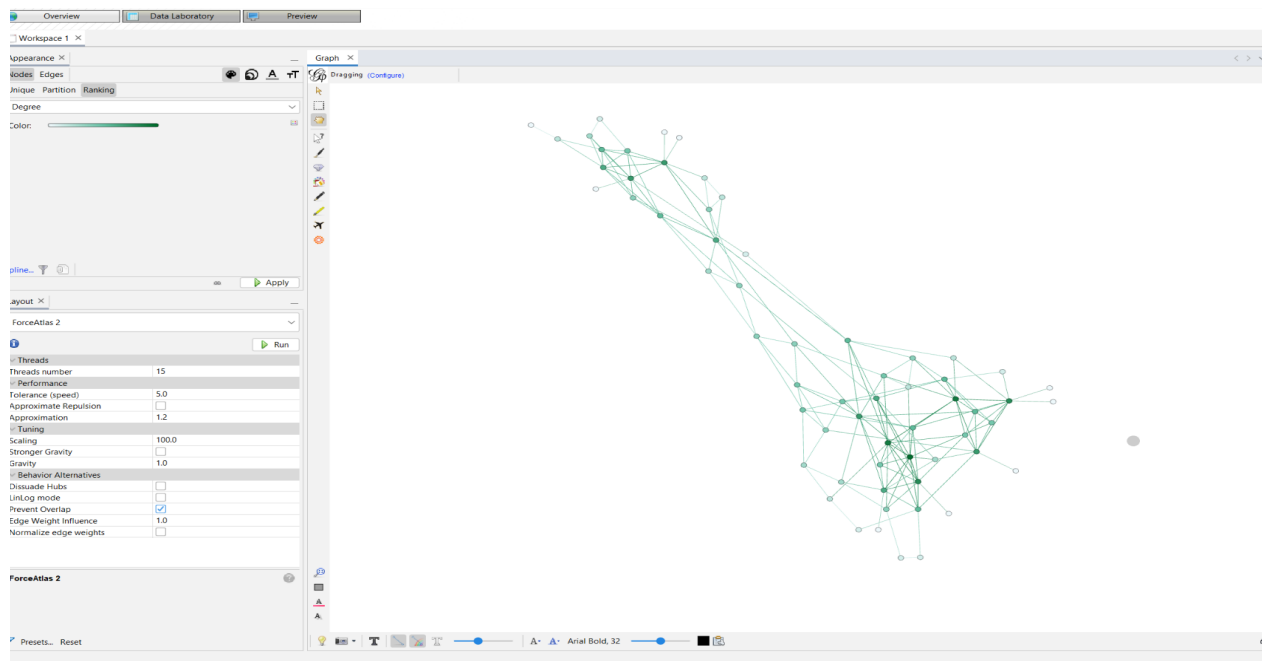
Step 5:

Ran Average Path length, defined min and max size of nodes from 5 to 75, and also used color to distinguish Betweenness Centrality measure.

Diameter- 8

Average Path Length- 3.356

Graph Distance Report

Parameters:
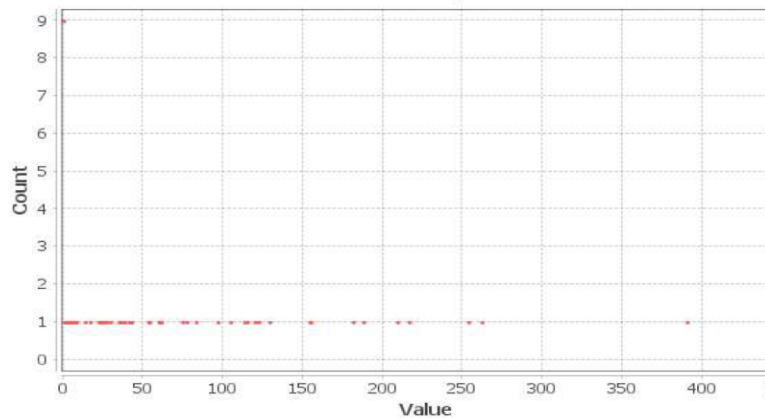
Network Interpretation: undirected

Results:
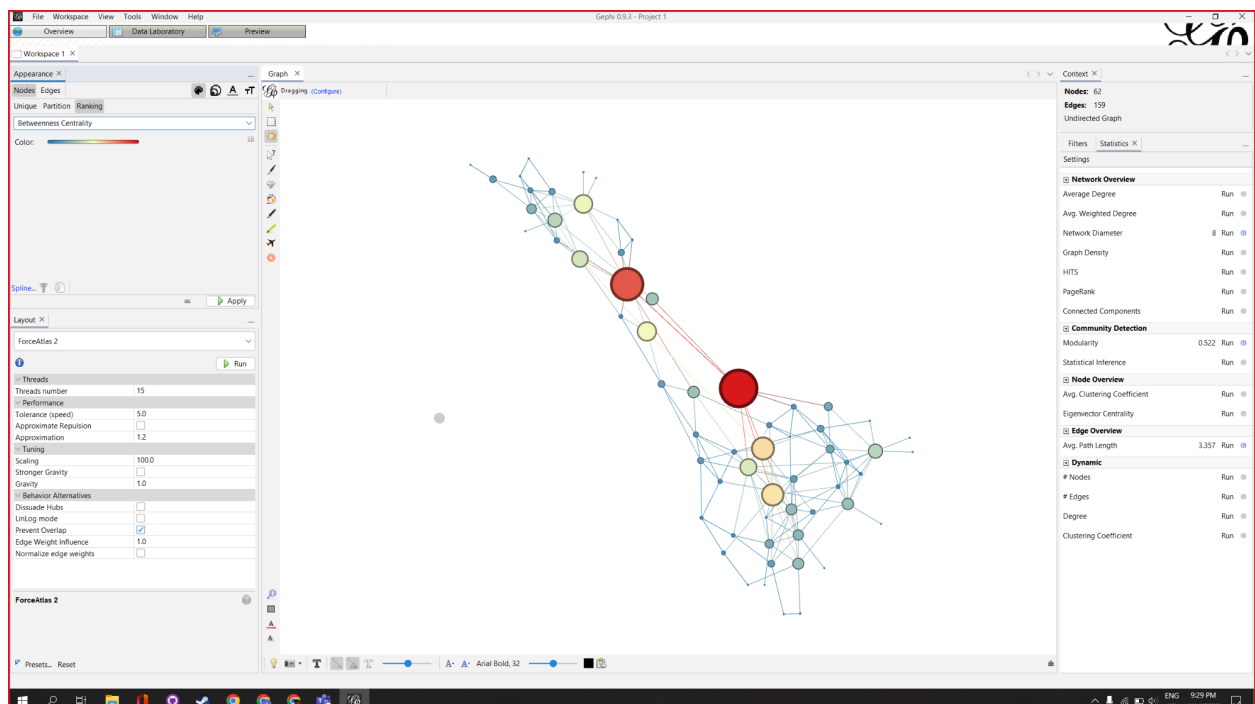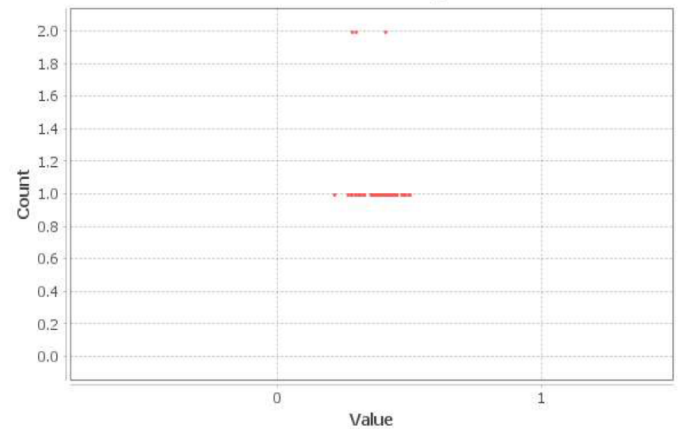
Diameter: 8
Radius: 5
Average Path length: 3.3569539925965097

Step 6:
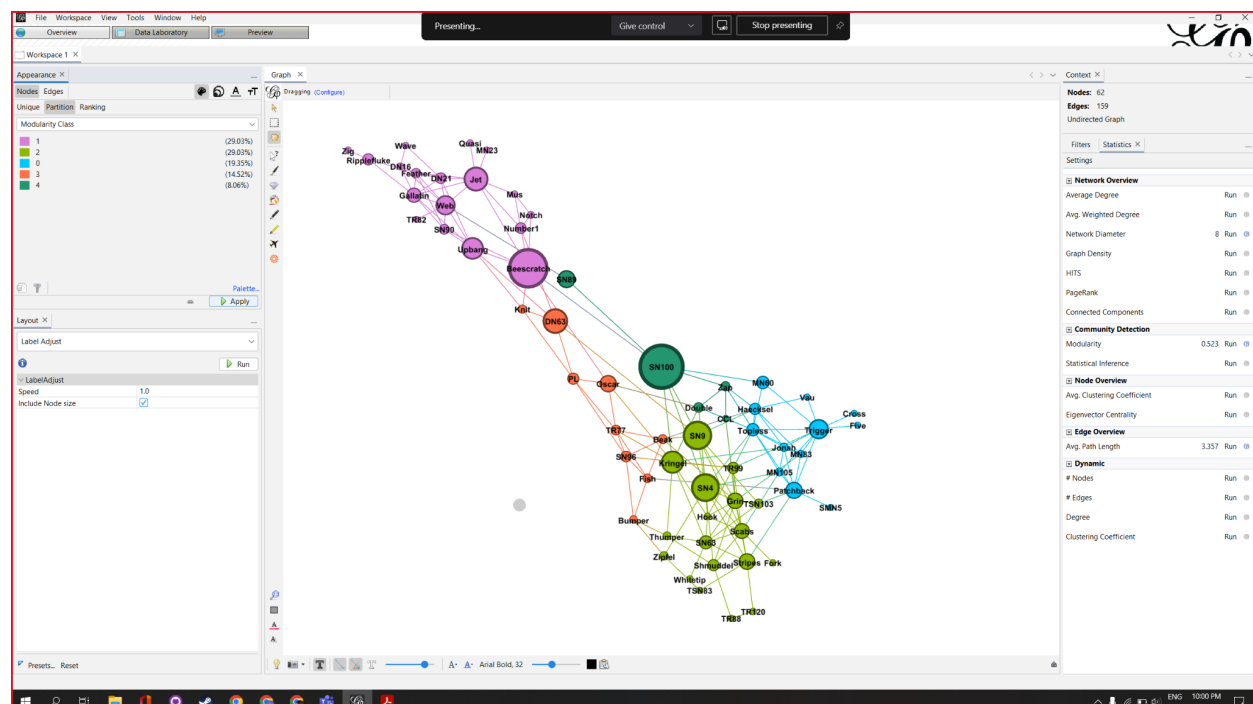Changed the Force Atlas "scaling" measure to 150 to tune the nodes, and make them more visible. Also changed the sizes of nodes as per betweenness centrality measures range from 15 to 100. The last addition was the inclusion of labels into the graph.
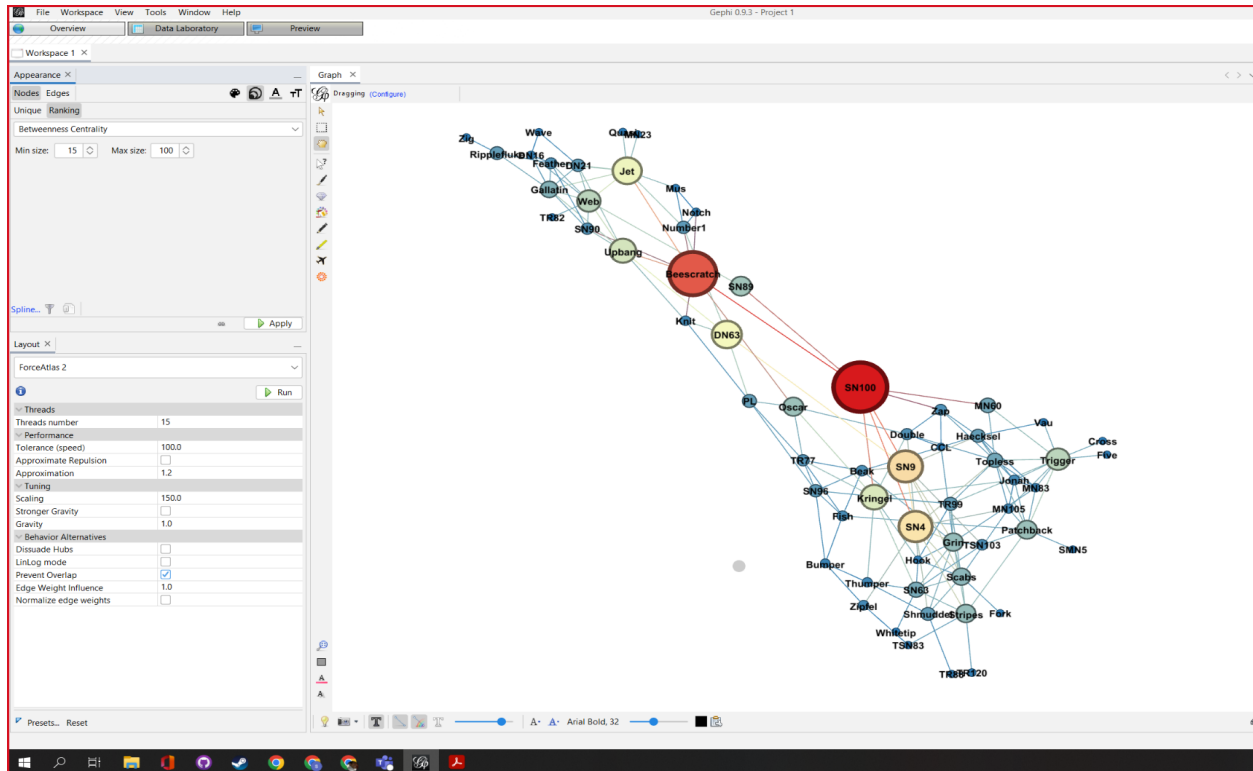
Step 7:
Ran Modularity and Modularity Classes in color palette.
Modularity here is used to measure the strength of division of a network into modules

Questions

	QUESTIONS	ANSWERS
a.	**Who are important entities from different points of view.**	The most important entities for this cluster are **Beescratch and SN100** as they have the highest degree
b.	**How many communities exist within the network?** **Examine the characteristics of each community.** **Why is a community different from other communities?**	A total of **5 communities** exist within this network. Let's suppose in the pink community, dolphin Beescratch has relations with two important nodes of its own community (Jet and Lipbang) and two other important nodes of neighboring communities (SN100 and DN63). We can infer that Beescratch is the leader of the pink community. Similarly, SN100 is the leader of the dark green community (as it has relations with dolphins of neighboring communities). We can assume that the various communities of dolphins are different from each other on the basis of their immediate groups. Dolphins from the same group stay together and have a close social network.
c.	**Examine the relationship of nodes within and outside communities.**	The dataset contains a list of all of the links, where a link represents frequent associations between dolphins.
d.	**Any further insights that you may draw by analyzing the network**	We observed that the dark green and the orange community of dolphins do not have any direct connections with each other. Also, the blue and light green dolphin communities are very highly interconnected.