

INTRODUCTION

This report visualises and explains the relationships among members of a research group using a **directed graph (DiGraph)**. The graph shows the direction of interactions between members and was created in Python using the **NetworkX** library.

The network was displayed using **Matplotlib**, where each member appears as a yellow-labeled node, and arrows show the direction of communication. The title of the network is “*Members of a Research Group.*”

WHY DO WE USE A DIRECTED GRAPH

- It shows the direction of relationship
- It captures real life interactions
- It helps show how information and influence flow in a group
- It helps in analysis of in- degree or Out -degree)
- It helps us identify leaders ,isolated individuals, key influencers within a group

The graph is made up of a set of 14 directed relationships among members : Frederick , Lydia , Abdul, Isaac , Pearl , Andrews and Emmanuel .

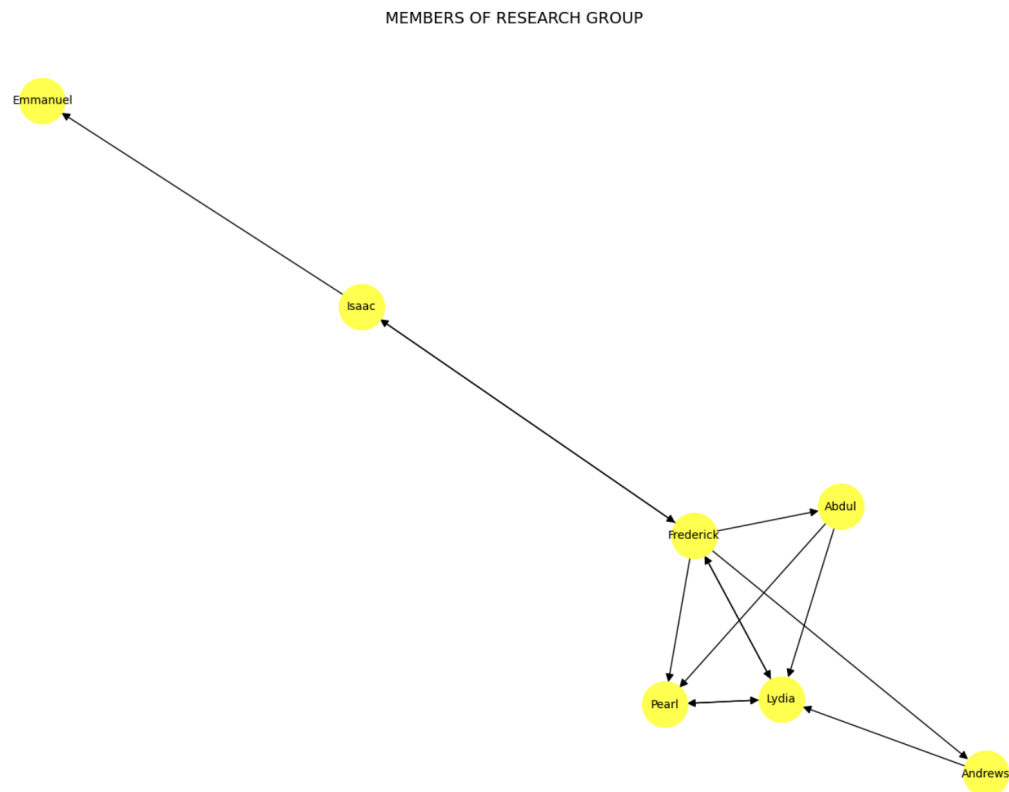
Network Size

Number of nodes	7
Number of edges	1
Isolated nodes	0

Network/ Degree distribution

Node	In-Degree	Out- Degree	Total Degree
Frederick	2	5	7
Abdul	1	3	3
Lydia	4	2	6
Isaac	1	2	3
Pearl	3	1	4
Andrews	1	1	2
Emmanuel	1	0	1

The figure below shows the network diagram



INTERPRETATION

- **Frederick and Lydia are the main influencers** in the group because they have the most connections.
- **Frederick** appears to be the leader since he starts most interactions and has most connections.
- **Lydia** receives many connections and acts as a **coordinator or intermediary**.
- They communicate both ways, showing strong collaboration and shared decision-making.
- **Abdul and Isaac** serve as supporting members who help connect others.
- **Emmanuel and Andrews** have limited interactions and appear less involved.
- There are no isolated nodes.

RECOMMENDATION

Emmanuel and Andrews should participate more in group communication.

CONCLUSION

Frederick is the leader while Lydia coordinates the research group, with Abdul and Isaac helping to maintain communication flow. Emmanuel and Andrews participate less. The directed graph provides a clear picture of how the group communicates and can be used to improve collaboration in the future.