UNIVERSITY OF GHANA

SCHOOL OF GRADUATE STUDIES

COLLEGE OF BASIC AND APPLIED SCIENCES

DEPARTMENT OF COMPUTER SCIENCE

COURSE: SOCIAL NETWORKS AND GRAPH ANALYSIS

COURSE CODE: DCSCD609-25

WEEK 4 ASSIGNMENT 1

QUESTION 1

Task:
Build a graph representing the relationships among members of your research group or department. Compute and interpret:

- Number of nodes and edges
- Degree distribution
- Any isolated nodes

Visualize the network using Gephi or Python (NetworkX).
Deliverables:

- 2-page report (PDF)
- Screenshot of visualization
- **Upload** your Python code file (.py) or Gephi file (.gexf) to Sakai and also, **submit/push your codes to the GitHub** assignment link - https://classroom.github.com/a/AYCdDWDE

REPORT ON DELIVERABLES FORM THE GRAPH (My Research Group)

Below is the analysis and summary from the Directed Graph (**My Research Group)**

1. **Overview of the Graph**
   Graphs are made up of nodes and edges where the nodes represent entities while the edges are the established relationships between the nodes. Therefore, the graph is made of seven nodes namely: Happy, Theresa, Esther, Gidi, Okai, Tagoe, and Bingo.
   The graph has 8 directed relationships (edges) between these individuals, which shows connections within the research group.

2. **Degree Distribution Analysis**

I. The degree of a node describes the total number of relationships flowing towards or flowing out from the node. So the degree distribution for individual nodes within the graph are as follows:
II. Happy: has a degree distribution of 4, making Happy the most connected node in the group. This shows that Happy might be a central figure, a key collaborator, or a bridge connecting various members.
III. Tagoe: Also, Tagoe, another node has a degree of 3, making Tagoe the second most connected node, playing an important role in information flow or collaboration.
IV. Bingo, Esther, Theresa, Esther and Okai: These nodes have equal degree distribution of 2. This implies that they are connected to a couple of other members or perhaps they like to engage in special activities in pairs.
V. Gidi: this node has the least number of connections indicating a less engagement in group activity or perhaps this node prefers to engage with just one other node.

Degree distribution: Happy: 4, Tagoe: 3, Bingo: 2, Esther: 2, Theresa: 2, Okai: 2, Gidi: 1

3**. Connectivity and Centrality**

No Isolated Nodes: On the issue of Isolated nodes, none were found after the execution of the code. This implies that all members of my research group are at least connected to another member(s) and there is communication and collaboration among members.

Considering the number of degree distribution nodes like Happy has, it imperative to say that Happy is the likely the leader of the research group or Happy actively participates and likes to work with different people.

In conclusion, the network demonstrates interconnections with Happy acting as the significant connector, ensuring that all members are part of the broader research group's collaborative structure.

SCREENSHOT OF VISUALIZATION