Amrita School of Computing
Department of Computer Science and Engineering

Minor Project: 19CSE495
(2020-2024 B. Tech CSE)

Problem Definition Document

(To be submitted by July 10,2023)

I. Project Title: Leader-Based Community Detection Algorithm in Attributed Networks

II. Team members (DB4**):**

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III. Abstract

The project aims to address the problem of community detection in attributed networks by developing a Leader-Based Community Detection Algorithm. Community detection refers to the task of identifying groups or communities of nodes within a network that exhibit strong interconnections. Attributed networks include additional information or attributes associated with nodes, which can provide valuable insights for community detection. The problem is relevant because accurately identifying communities in attributed networks can help in various domains such as social network analysis, recommendation systems, and understanding complex relationships. The proposed algorithm will leverage the attributes and network structure to improve the accuracy and effectiveness of community detection in such networks.

IV. Motivation

The motivation for choosing the project of developing a Leader-Based Community Detection Algorithm in attributed networks is driven by the need for more accurate and effective community detection methods in complex networks. Traditional community detection algorithms often overlook the additional information or attributes associated with

nodes in the network, leading to suboptimal results. By incorporating attribute information and leveraging the network structure, the proposed algorithm aims to improve the accuracy and quality of community detection in attributed networks.

Q. Give a suitable example scenario to detail the motivation.

For example, consider a social media platform that wants to identify communities of users based on their interests, demographics, and social connections. Traditional community detection algorithms that solely rely on network connectivity might group together users who are only loosely connected but share similar attributes, leading to inaccurate community assignments. By utilizing the attributes associated with users and considering their network connections, the Leader-Based Community Detection Algorithm can better identify cohesive and meaningful communities that reflect the users' shared interests and relationships. This can help the social media platform in providing more personalized recommendations, targeted advertisements, and improved user engagement based on these identified communities.

With this information, the e-commerce company can personalize the user experience by recommending relevant products and promotions to each community. They can tailor marketing campaigns specifically for fashion enthusiasts, offer targeted discounts, and foster engagement within the community. By accurately detecting communities based on attributes and network structure, the company can enhance customer satisfaction, increase sales, and foster a vibrant and connected user community on their platform.

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