PSTAT 194 Final Project Information

Final Project for Introduction to Social Network Analysis

Timeline

1. **Week 8 Section (Monday, May 20, 2024)**: Register your group with your TA and get information about the dataset/network signup sheet.
2. **Dataset Selection**: Pick a network from **here** and add it to the dataset/network signup sheet along with a short title for your project. Ensure no other group has selected the same dataset. Discuss your network/dataset with the instructor/TA if needed.
3. **Week 9 Section (Monday, May 27, 2024)**: Sign up to present your group project either on Week 10 Wednesday or Friday (first come, first served) during regular class time.
4. **Week 10 Presentation**: Present in class as per your signup and peer-grade other presentations.
5. **Submission Deadline (Friday, June 7, 2024, 11:59 PM)**: Submit a short group write-up and presentation slides on Canvas. Include .Rmd, .pdf, and .zip files.

Project Guidelines

Feel free to take your project in any direction that seems interesting to your group. Share your successes as well as any challenges you faced. The focus is on learning and sharing your insights!

Steps to Get Started

1. **Load and Prepare the Data**:
   - Load your chosen dataset into the course RStudio server and convert it to an 'igraph' object.
   - Consider what the vertices and edges represent in your network.
   - Identify basic network elements: vertices, edges, weights, directionality, etc.
2. **Generate Induced Subgraphs**:
   - Create four induced subgraphs with 200 random nodes each from your dataset.
   - Example: `sub.network1 <- induced.subgraph(mynetwork, sample(V(mynetwork), 200))`
3. **Visualize the Networks**:
   - Use three different layouts from the `igraph` package to visualize each network.
   - Experiment with node and edge attributes to enhance visualizations.
4. **Analyze Network Metrics**:
   - Explore various network, node, and edge metrics.
   - Interpret these metrics in the context of your network.
5. **Community Detection**:
   - Run community detection algorithms.
   - Analyze and interpret the resulting communities.

6. **Adjacency Matrix**:
    - Examine the adjacency matrix of your network.
    - Reorder vertices to highlight patterns.
7. **Reorder Nodes**:
    - Reorder nodes based on community or connected component.
    - Observe changes in the adjacency matrix and identify clearer patterns.
8. **Summarize Findings**:
    - Prepare a presentation and a short write-up summarizing your analysis and findings.

Presentation

- **Format**: 10 minutes presentation followed by 5 minutes Q&A.
- **Content**: Summarize your project's findings and insights.
- **Notes**:
    - Each team member should present some part of the project.
    - Slides for the presentation must be submitted to the **Google Drive Folder** by 2pm on the day of your group presentation and should include your short project title as the file name.
    - During class presentations, all peers, except for the presenting group, will evaluate the presentations. Each peer is required to provide a short paragraph of feedback for each presentation. This feedback should include one aspect you particularly liked about each presenter and one suggestion for improvement for each presenter as constructive criticism.

Submission

- **Deadline**: Friday, June 7, 2024, 11:59 PM.
- **Files**: Submit .Rmd, .pdf, and .zip files of your write-up and presentation slides on Canvas.
- **Group Information**: Ensure all group members' names are included in the submission documents.
- **Length**: 3-4 pages main write-up with sections below and extra pages for references and appendices with figures and code as necessary.

Formatting Instructions for Group Report

1. **Title Page**:
    - Project Title
    - Group Members' Names
    - Date
2. **Introduction**:
    - Brief description of the network dataset.
    - Objectives of the analysis.
3. **Methodology**:
    - Steps followed in data processing.
    - Tools and packages used (e.g., R, igraph).
4. **Analysis**:
    - Description and visualization of subgraphs.
    - Metrics and community detection results.

- Interpretation of adjacency matrix reorderings.

5. **Results**:
   - Key findings from the analysis.
   - Visual and textual summaries.
6. **Conclusion**:
   - Summary of insights gained.
   - Possible future directions for further analysis.
7. **References**:
   - List of references and datasets used.
8. **Appendices (as necessary)**:
   - Additional figures and code referenced in the main report.

Grading Rubric

Criterion	Excellent (90-100%)	Good (80-89%)	Satisfactory (70-79%)	Needs Improvement (60-69%)	Poor (below 60%)
Dataset Selection	Unique and appropriate dataset selected	Appropriate dataset, minimal duplication	Dataset selected but lacks originality	Dataset selected without much thought	No dataset selected or inappropriate
Visualization	Clear, detailed, and insightful visuals	Clear and detailed visuals	Basic visuals with minimal detail	Poorly executed visuals	No visuals or incomprehensible visuals
Analysis	Comprehensive, thorough, and insightful	Thorough and insightful	Basic analysis with some insights	Minimal analysis	No analysis or very poor analysis
Community Detection	Detailed and insightful interpretation	Clear interpretation	Basic interpretation	Minimal interpretation	No interpretation
Adjacency Matrix	Clear patterns and thorough interpretation	Clear patterns	Basic examination	Minimal examination	No examination
Presentation	Clear, engaging, well-structured	Clear and structured	Basic structure, minimal engagement	Poorly structured, lacks engagement	Unclear, unstructured
Write-up	Well-written, comprehensive, and clear	Well-written and clear	Basic clarity, minor errors	Poorly written, several errors	Incomprehensible, numerous errors
Group Collaboration	Evident collaboration, all members contribute	Clear collaboration, most members contribute	Basic collaboration, some members contribute	Minimal collaboration, few members contribute	No evident collaboration
Adherence to Guidelines	Followed all instructions perfectly	Followed most instructions	Followed some instructions	Minimal adherence to instructions	Did not follow instructions

Feel free to ask any questions or seek clarification as you work on your projects. Good luck!