Exercise 9: Relational Data (20 points)

Due: 01.07.2024 10 AM

This exercise aims to compare node-link diagrams with adjacency matrices.
Please find yourself in groups of **2 students**. Only 1 member of the group must submit the exercise in ILIAS.

Instructions:

1. Download the attached folder named "exercise09", which contains the necessary files for your programming task: an HTML file, a CSS file, and JavaScript files.
2. Edit each of the files according to the tasks provided in the exercise.
3. Ensure that all changes you make are visible when opening the "index.html" file with your web browser.
4. Compile all the modified files into a zip file named "Exercise09_submission.zip" for submission.

Task 1: Node-link Diagrams (10 points)

The goal of this task is to implement an interactive node-link diagram with D3. An unfinished implementation is available in the folder exercise09. The data can be found in the file data.js. Your task is to finish the implementation by following the *TASKS* specified in the respective files.
GOAL: When opening the index.html file, a node-link diagram (Figure 01) should appear. After activating the aggregation by pressing the button *"Sum Houses"*, the visualization should change (Figure 01 right).

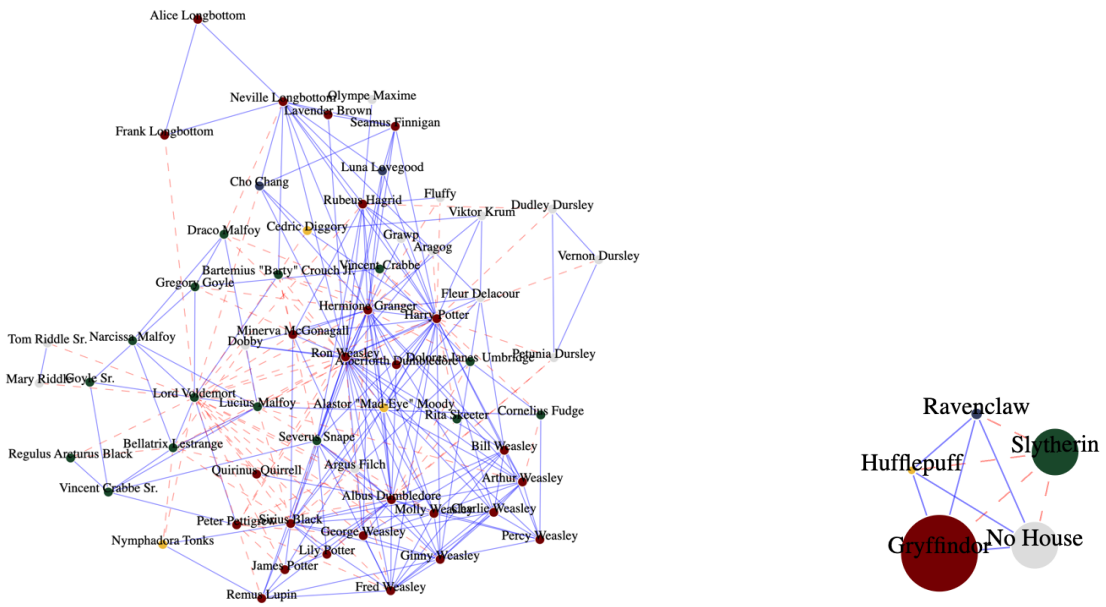

Figure 01: The node-link diagram represents the individual characters of the Harry Potter novels. The visualization can be aggregated by pressing the button *"Sum Houses"* (right).

Task 2: Node-link Diagram vs. Adjacency Matrix **(10 points)**

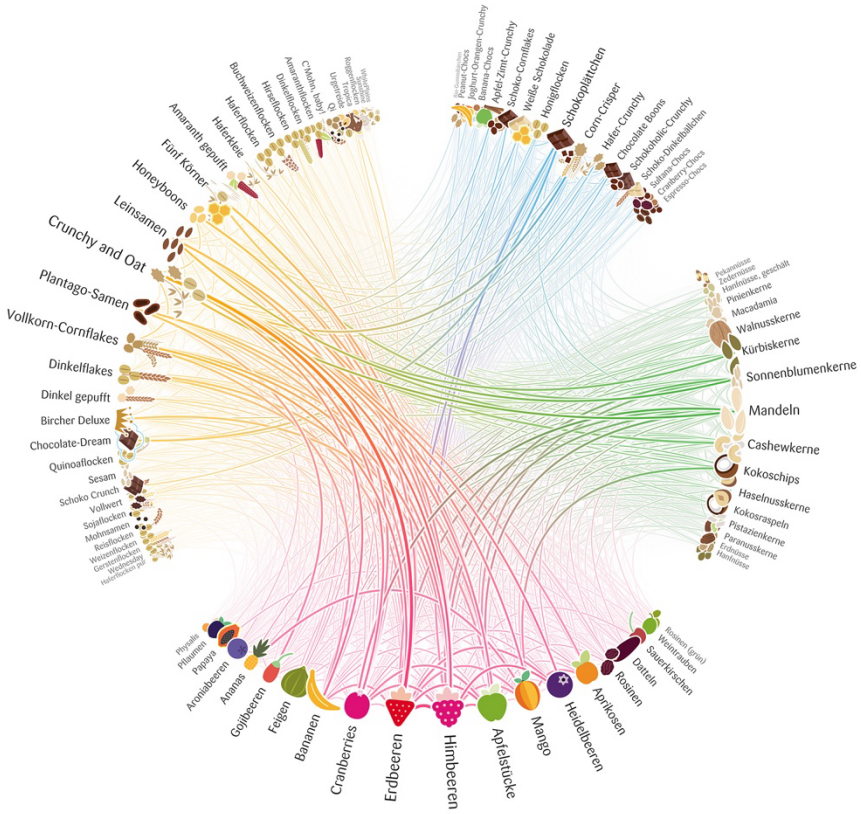

Figure 02: The node-link diagram represents müsli ingredients. Connections between ingredients indicate combinations, with line thickness reflecting the frequency of these combinations.

Please answer the following questions in the index.html file.

Task 2 a) – Given Figure 02, name **TWO** combinations of ingredients that were combined most often.

Task 2 b) – If we would represent the same data shown in Figure 02 with an adjacency matrix, would the task (Task 2a) be simpler to solve? Explain why or why not.

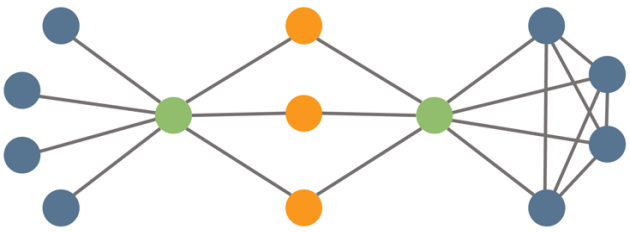

Figure 03: A node-link diagram with 13 nodes.

Task 2 c) – Transform the node-link diagram shown in Figure 03 to an adjacency matrix. How many patterns can be found? Name and explain those patterns.

Task 2 d) – You were given a social network of 100 people. You want to identify whether **person A** and **person B** know each other. If there is no direct connection, you want to find a path between the two nodes. Which visualization technique would you choose (node-link diagram or adjacency matrix)? Explain your choice.

Submission: Zipped Exercise09_submission folder, including all files