

## **Title: Explanation of Code Modifications and Analytical Decisions**

**1. Centrality Extension** To better understand which directors are most connected or influential in the network, we used three centrality measures: Degree Centrality, Betweenness Centrality, and PageRank. Degree Centrality showed us which directors had the most direct links to others. Betweenness helped find those who connected different groups, even if they didn't have many links. We also added PageRank to focus on directors connected to other powerful directors. This gave a more balanced view of influence across the network.

**2. Code Repair (4 Fixes)** We chose four changes to improve the code:

- **Fix 1 – Column Naming Consistency:** The name column in the director dataset was changed to uppercase to match the format in the rest of the code. This helped avoid errors when combining datasets.
- **Fix 2 – Software Background Clean-up:** The software background column had messy values. We turned it into True or False values to make it easier to analyse.
- **Fix 3 – Add Role to Summary:** The director summary was missing role information. We added it so the analysis includes more complete details about each director.
- **Fix 4 – Reset Index for Clean Merging:** After grouping data, we reset the index to make sure it could be joined with other data later. Without this, some future steps could fail.

Each change helped improve how well the code works or how easy it is to understand.

**3. Exploring an Unused Feature** We used start and end dates to calculate how long directors worked in a company. This “tenure” information helps us see who stayed longer and might have had more experience or influence. It was not used in the original work, so it added a new layer of insight to the data.

**4. Complementary Dataset** We used a separate dataset with company financials like sales by country and segment. After cleaning it up and fixing missing values, we matched this data with director data. This allowed us to explore if more connected directors were linked with higher-performing companies. It added value to the project by linking network data with business outcomes.

## **5. Refinement Tasks**

**(b) Data Visualisation for Non-Technical Audiences:** We made a bar chart showing average sales by segment. It's easy to read and helps people who don't know much about data quickly see which areas bring in the most money.

**(c) Ethical Considerations:** We looked at the ethical side of using director data. Even though it's public, connecting and analysing it might reveal things that people didn't expect. We were careful not to judge anyone unfairly and made sure our work focused on learning, not harming. We also considered if some groups were underrepresented or if our results might be biased.

**Conclusion** All changes made the project easier to understand, more accurate, and more thoughtful. We improved the code, added new useful information, and presented it in a way that's both fair and meaningful.