COMP5048 Week 5 Homework

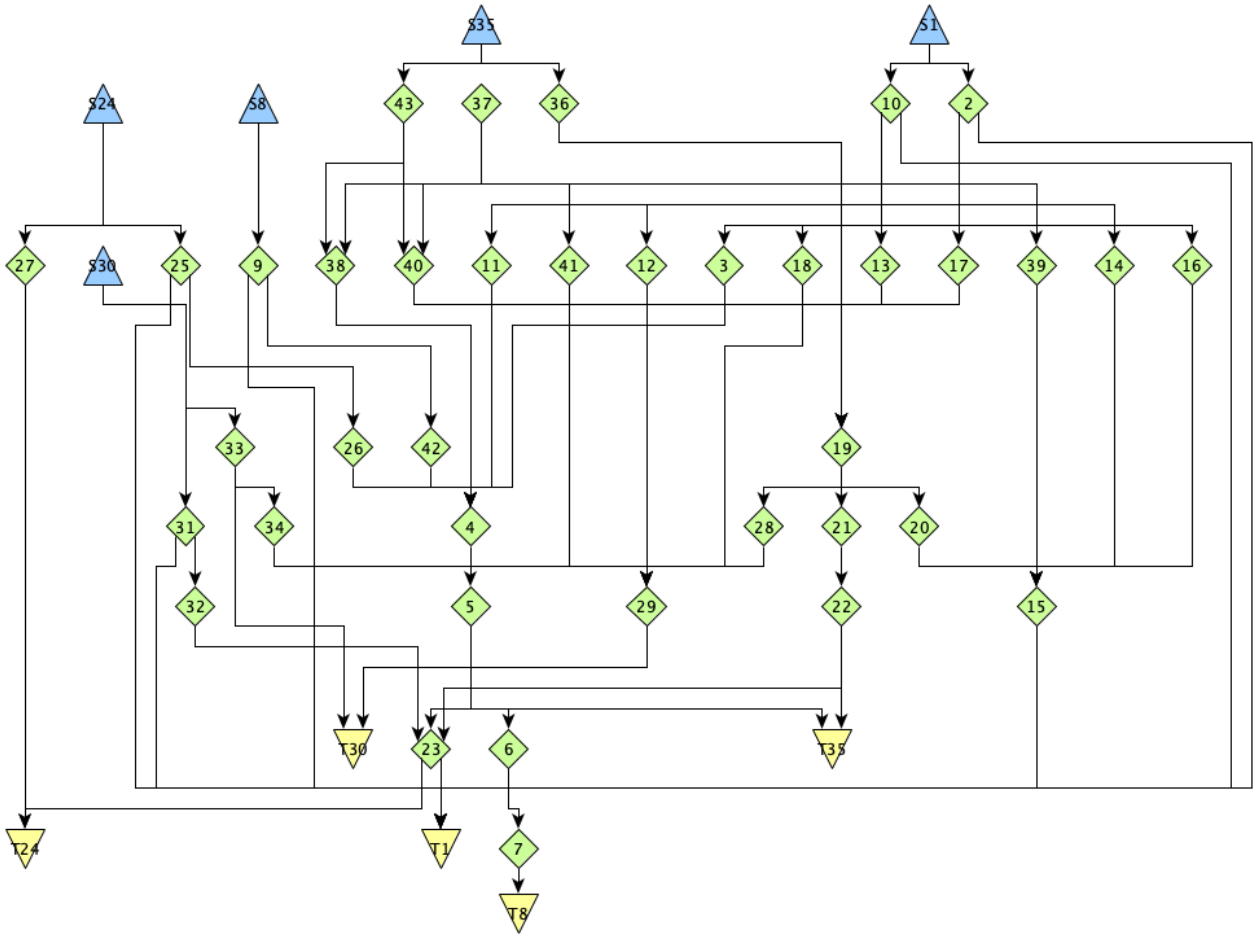
Designed by: Jiarui Xu Date: 2023/3

* NOTE: THE PYTHON CODE SECTIONS ARE IN THE APPENDIX.

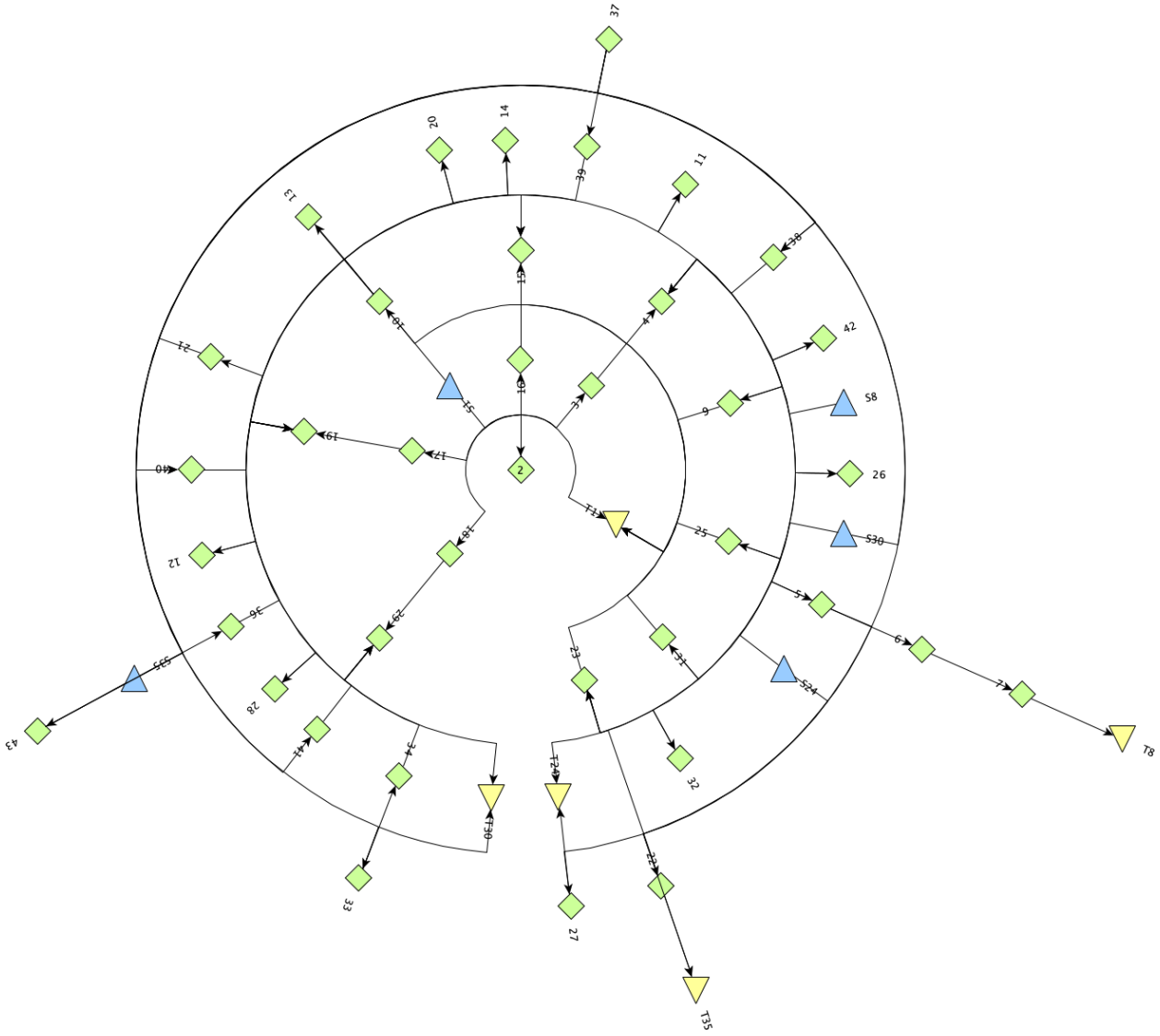
Task 1:

Create a visualisation of the directed graph in world.gv or world.gml (same graph in different file formats) using at least two different hierarchical layouts. Use visual variables to highlight the source nodes (names prefixed with S) and the sink nodes (names prefixed with T).

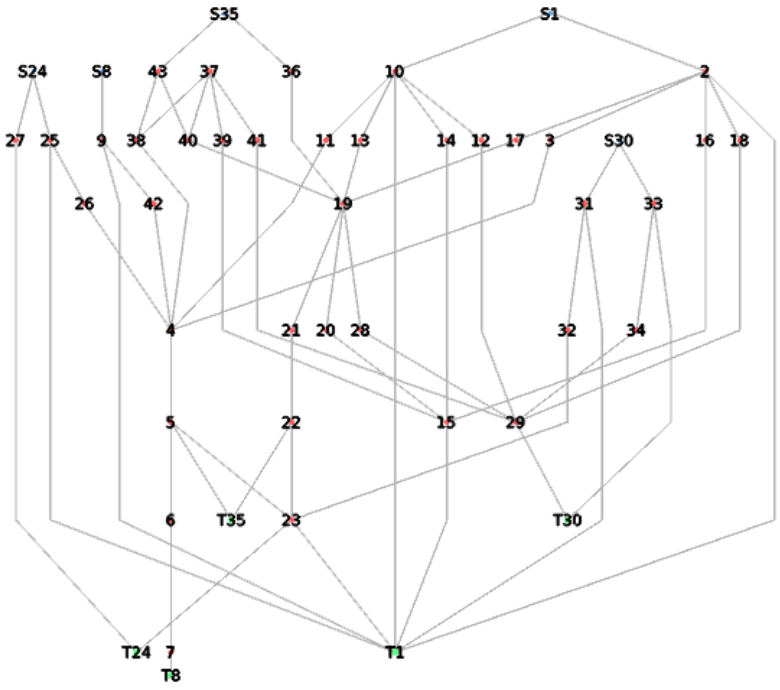
1. Using yEd Hierarchical Layout



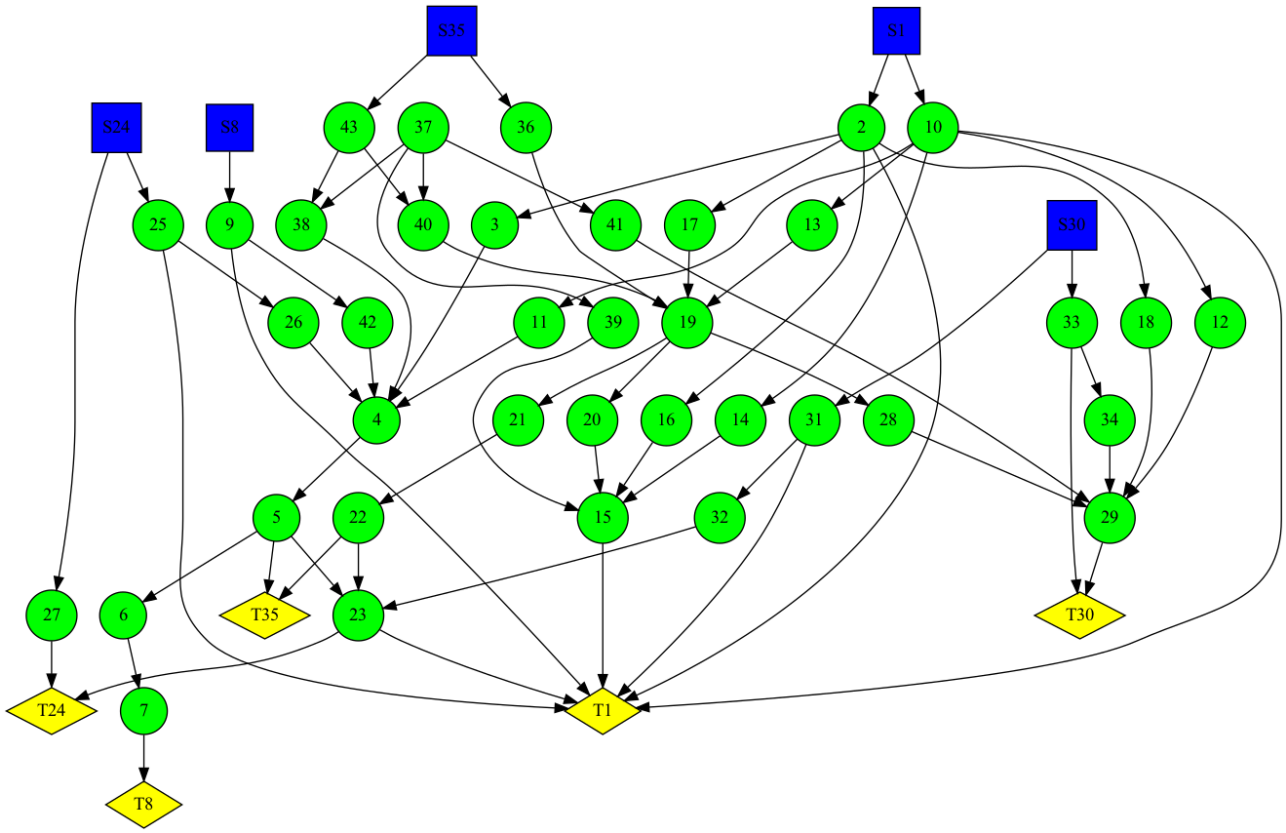
2. Using yEd Radial Layout



3. Using Tulip Sugiyama Layout



4. Using Graphviz Hierarchical Layout

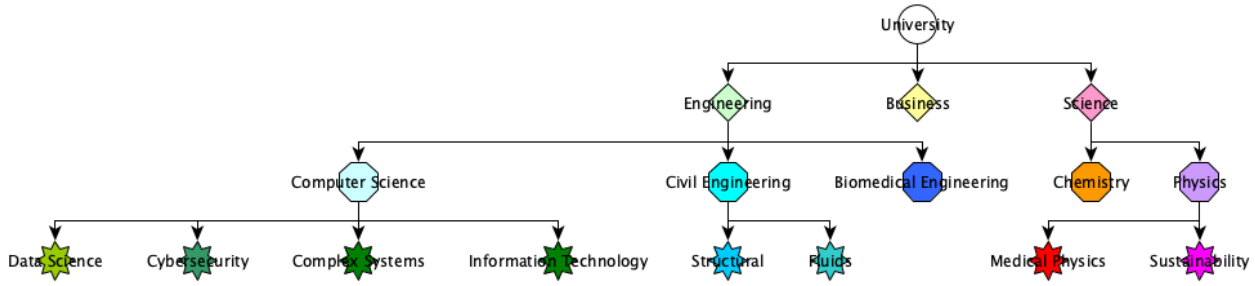


Task 2:

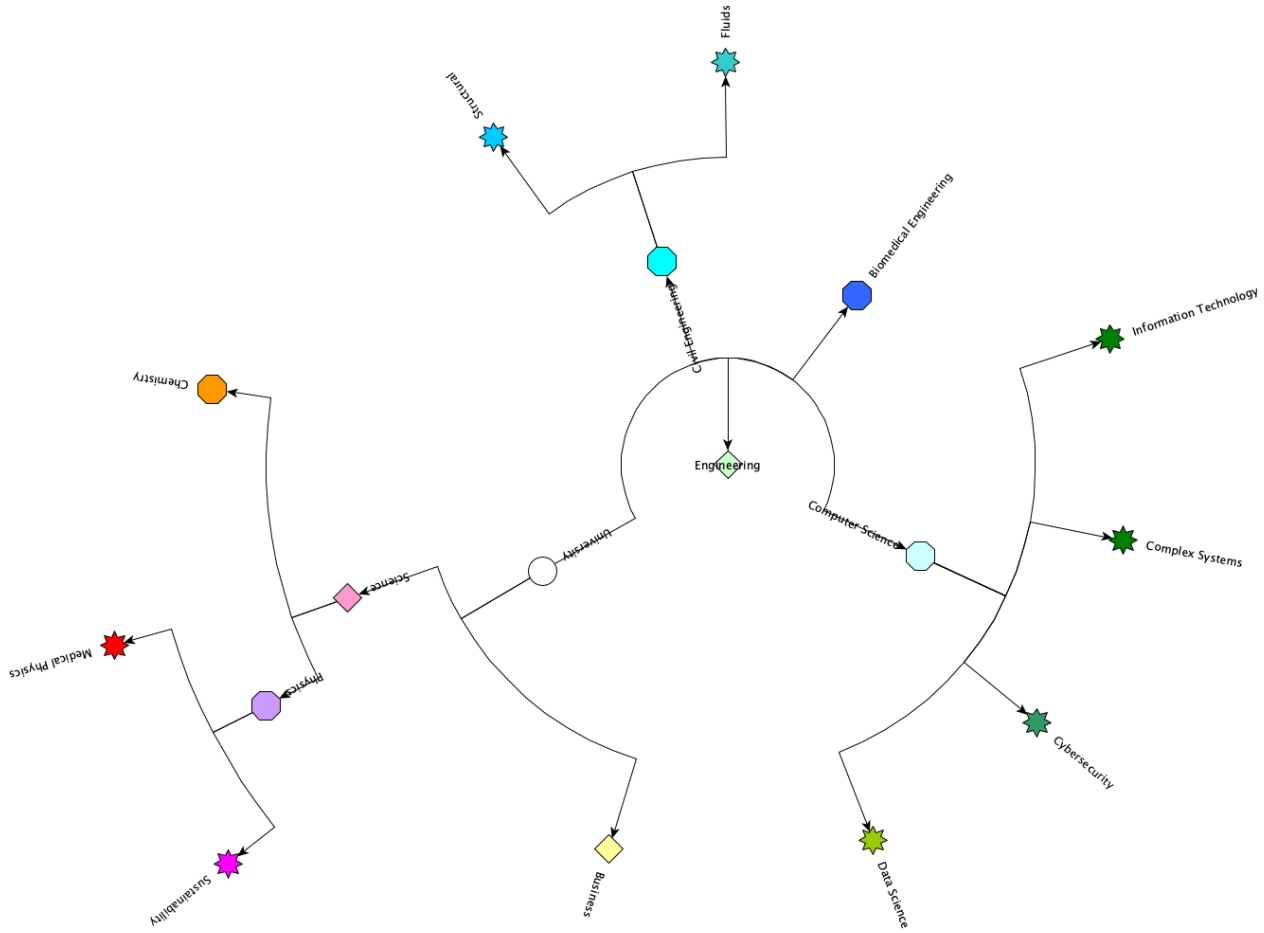
Create a small graph (10–15 vertices) of a hierarchical network of your choice; examples include software dependencies or a company reporting structure. Use two different hierarchical layouts to visualise the graph.

* Note: The code for creating this original social network graph is shown in the appendix.

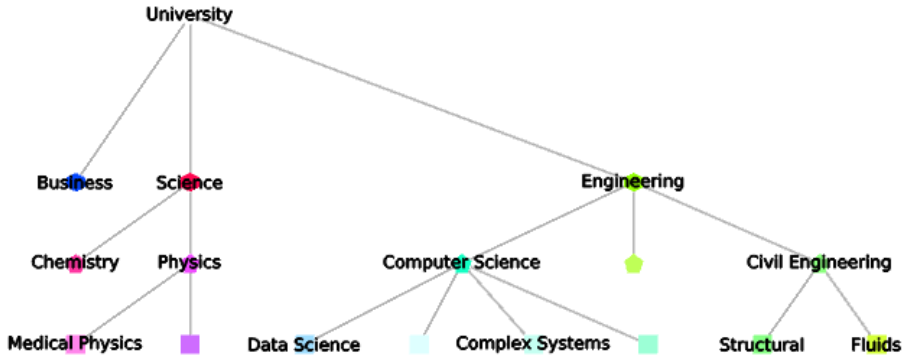
1. Using yEd Hierarchical layout



2. Using yEd Radial layout



3. Using Tulip Sugiyama layout



Appendix(Code):

```
# Task 2 Construct the network
import networkx as nx
G = nx.DiGraph()
edges = [("University", "Engineering"), ("University", "Business"), ("University", "Science"),
        ("Science", "Chemistry"), ("Science", "Physics"),
        ("Physics", "Medical Physics"), ("Physics", "Sustainability"),
        ("Engineering", "Computer Science"), ("Engineering", "Civil Engineering"),
        ("Engineering", "Biomedical Engineering"),
        ("Civil Engineering", "Structural"), ("Civil Engineering", "Fluids"),
        ("Computer Science", "Data Science"), ("Computer Science", "Cybersecurity"),
        ("Computer Science", "Complex Systems"), ("Computer Science", "Information
Technology") ]
G.add_edges_from(edges)
nx.write_gml(G, "hierachical_structure.gml")
```