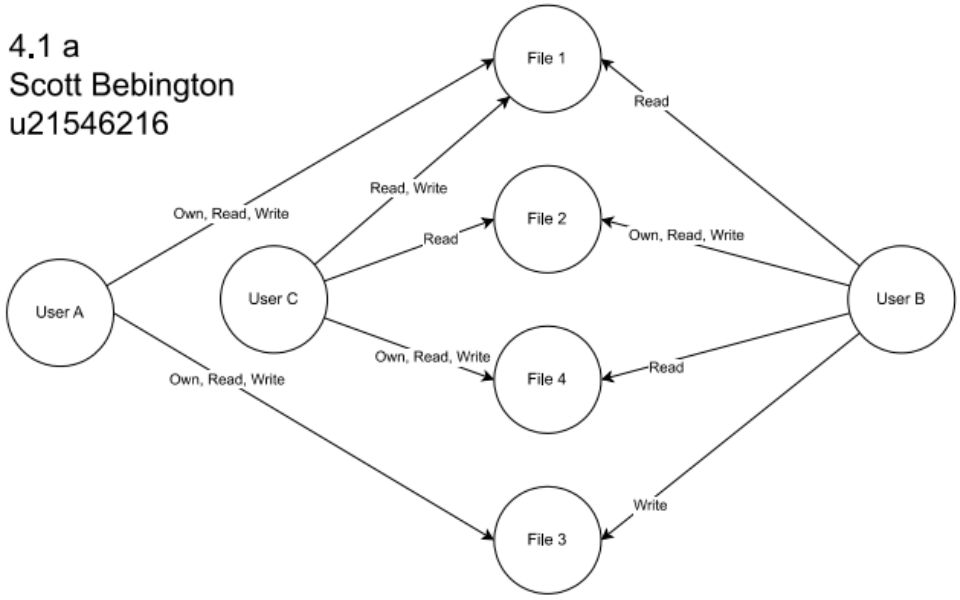

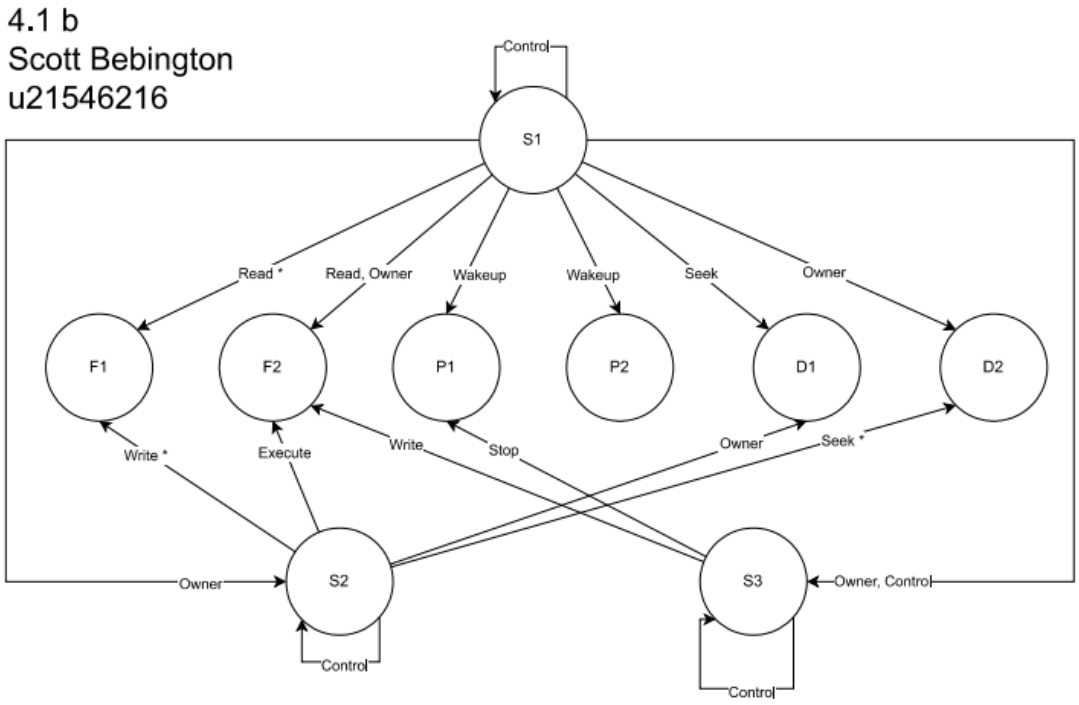

4.1 c) Yes there is a 1-1 relationship, each subject in the tables links to only 1 node in the graphs, each object in the tables links to only 1 node in the graphs, each cell in the tables links to only 1 link in the graphs. This proves that there is a 1-1 relationship between the table representation and the graph representation.

4.3 a)

Advantages:

1. Increased modularity: With the addition of the Executive and Supervisor modes, there can be separation of concerns leading to each mode handling more specific needs without the need for a bigger picture, this ensures a more structured codebase and low code coupling.
2. Increased Security: By having the Executive and Supervisor modes. Sensitive operation can be restricted to the higher privileged modes, this would ensure that an attacker wouldn't be allowed to execute these operations with user level code as this code wouldn't have the correct privileges.

Disadvantages:

1. Complexity: with many more "Moving parts", the complexity of the system design increases, this could lead to more bugs, harder code maintenance if the code is highly coupled and a higher learning curve for anyone new to the system.
2. Resource management: With the addition of 2 modes, it is more likely that the nodes may need the same bit of information at the same time causing a bottleneck and slowing down the system as a whole.

4.3 b)

It is possible to add more modes to the system over and above the 4 already included:

1. Container: With the introduction of containers, entire operations can be carried out separately from the rest of the system as its own mini subsystem, this could increase resource allocation and security.
2. Real time operations: There could be a mode dedicated to handling real time operations, this mode could handle interrupts and check to see which operations are more important and which ones are less important to cause the interrupts.