CS 5001: Lab 9 Reflection

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What I Learned
During this exercise, I learned how to implement a depth-first search (DFS) algorithm to find paths in a directed graph. I gained a better understanding of how graphs can be represented using dictionaries in Python, where keys represent nodes and values represent sets of neighbouring nodes. I also revisited recursion and how it can be used to explore all possible paths in a graph until a solution is found or all options are exhausted.

Problems Encountered
While working on the code, I faced a few challenges:
1. Recursion: Initially, I struggled with how recursion could be applied here, especially how the function calls itself with updated parameters. It was difficult to visualize how the function would backtrack once it reached a dead end.
2. Cycle Prevention: I was unsure about how to effectively prevent cycles in the graph. I had to think carefully about how to track visited nodes without losing the ability to explore other paths.

Overcoming Challenges
To overcome these challenges, I took the following steps:
- Visualizing the Process: I drew diagrams of the graph and traced the pathfinding process step by step. This helped me understand how the DFS algorithm explores nodes and backtracks when necessary.
- Research: I read additional resources on recursion and DFS algorithms, which clarified my understanding and provided examples that I could relate to my own code.

Challenge Level
I found this exercise to be moderately challenging. The implementation of the DFS algorithm was straightforward once I grasped the recursive nature of the function. However, ensuring that the algorithm correctly handled cycles and returned the right paths required careful thought and testing.

Additional Thoughts
Overall, I enjoyed this exercise and it reinforced my understanding of graph theory and algorithms. I appreciate the opportunity to work on practical coding problems that have real-world applications, such as pathfinding in networks. In conclusion, this exercise has strengthened my coding skills and deepened my understanding of algorithms, and I look forward to tackling more complex problems in the future.