

CMPSC 462 (Fall 2024)

Data Structures

Final Project:

Your Project Title

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1. **INTRODUCTION**

Introduction for the project

// Insert page numbers in all page and so you can refer it in the Outline.

Abstract: This project aims to develop a course selection app that assists students in verifying course prerequisites using directed graph data structures. The app ensures that students meet all required prerequisites before selecting advanced courses, reducing the risk of registration errors. Implemented in Python, the app leverages directed graphs to represent course prerequisites efficiently, facilitating validation checks and providing students with a smooth course selection experience.

Goal: To create a functional software application that verifies prerequisite requirements in course selection by using directed graphs to represent and validate course dependencies. This project will not only address course prerequisite checking but will also introduce an element of data structure innovation beyond class content.

Objectives: Implement directed graphs to represent course prerequisites. Design algorithms that verify if selected courses fulfill prerequisite requirements. Develop a user-friendly interface for students to select and check their courses. Add an additional feature, such as course dependency visualization.

1. **BACKGROUND**

You can discuss the theory behind any specific functions being used in the software

1. **DESIGN & IMPLEMENTATION**

* Design should also include a block diagram or class diagram or any UML diagram.

A paper with writing on it

Description automatically generated

* Choose a proper data structure and justify why are you using this data structure by comparing the pro and cons with other data structures.

The directed graph is chosen for prerequisite management due to its ability to represent dependencies between courses. Unlike trees, directed graphs allow for more complex relationships, including multiple prerequisites. Other structures like lists or sets would not have the hierarchical nature needed for representing dependencies.

* Discuss user and functional requirements of the software.
* Explain the development of the software and also explain the functionalities with help of appropriate code snippets.
* Perform time complexity analysis for all the important functions.

1. **RESULTS / SAMPLE OUTPUTS**

Note: If you use a large set of data, you can show a part of the screenshot for your sample result.

1. **CONCLUSION**

Include each team member’s contribution too.

1. **CONTRIBUTION**
2. **REFERENCES**

Cite your source of reference here