Course Prerequisites:

A Demonstration of Directed Graphs

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16 Nov 2024

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**Introduction**

This project is a study of directed graphs through a simplified representation of courses from the Computer Science department at the University of Missouri Kansas City (UMKC) and their prerequisites. The purpose of this project is to establish a deeper understanding of the implementation of directed graphs. The scope is limited to computer science courses at UMKC, plus a few external courses from other departments as required. Implementation is rudimentary, with courses displayed in a grid of nodes connected by edges.

**Objectives**

The goal of this documentation is to serve as a reflection on the planning, framing, and implementation of the directed graph of courses.

**Methodology**

The software implementation of this project was created in C++ using the Qt graphical library to display the graph. All data was obtained from the UMKC Course Catalog.

**Concepts**

What is a directed graph? To answer this question, we first must understand the concept of a graph. A graph G is a collected of points known as vertices (singular: vertex), represented by V, connected by edges, represented by E. A directed graph is a graph where the edges are directional. In other words, each edges points from one vertex to another. In a directed graph, if edge e1 points from vertex v1 to vertex v2, this only shows a relationship from v1→v2 and does not imply v2→v1.

How can a directed graph of courses and their prerequisites be modeled? Physically, this graph can be modeled by plotting a series of nodes that represent each course, connected by a series of lines representing prerequisite relationships.

**1. Title Page:**

* Include the project title.
* Mention the author(s) and date of creation.

**2. Table of Contents:**

* List all sections and subsections with page numbers.

**3. Introduction:**

* Provide an overview of the project.
* Explain the purpose and scope.

**4. Objectives:**

* Define the goals and objectives of the documentation.

**5. Methodology:**

* Describe the approach used for creating the documentation.
* Include research methods and data sources.

**6. Content Body:**

* Organize content logically with headings and subheadings.
* Explain concepts clearly and concisely.
* Use bullet points, tables, and diagrams for better comprehension.

**7. Examples:**

* Include practical examples to illustrate key points.
* Use screenshots if applicable.

**8. Conclusion:**

* Summarize key findings and insights.
* Discuss any limitations or future considerations.

**9. References:**

* List all sources used for research and information.

**10. Appendices:**

* Include any additional material relevant to the documentation.

**11. Review and Editing:**

* Proofread for errors in grammar, spelling, and formatting.
* Ensure consistency in style and tone throughout.

**12. Finalization:**

* Review the document one final time before submission.