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Report on Innovative Teaching Practices: Book-end Method for CST201 DATA STRUCTURES

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Semester/Branch: S3 CSE

Subject: CST201 DATA STRUCTURES

Faculty: Ms. Shemimol B

Innovative Teaching Method: **Book-end Method**

Topic/Question: Graph Representation

Introduction

The goal of this report is to show how new teaching methods were used in the CST 201 Data Structure course, focusing on teaching Graph Representation Using the book-end method. This method is meant to increase student involvement, help them understand better, and encourage active participation in class.

Book-end Method Approach

Overview

In Module 4, called Graph Representation, the book-end method was used to present the course content. This method breaks the lecture into three parts: an introduction, a middle part with interactive activities, and a conclusion. This setup keeps students engaged and reinforces learning with different teaching techniques.

Rationale

The book-end method was chosen because it:

- Encourages active learning and student participation.
- Makes good use of class time by mixing lectures with interactive activities.

Student Response

Application Exercise

After the lecture on Graph Representation, students wrote a brief paper summarizing the main ideas discussed. This activity took place in the classroom, and the papers were reviewed with feedback provided in the next class.

Conclusion

Using the book-end method to teach Graph Representation in Data Structures, where students are engaged through a structured lecture format followed by an application exercise, can greatly improve the learning experience. This method helps students process the material in smaller, manageable parts, stay actively involved, and show their understanding through minute papers.

Minute Paper

The image shows two pages of handwritten student work on graph representation. The left page includes a definition of a graph, a set representation of a graph with 7 nodes and 7 edges, and a linked list representation. The right page shows a matrix representation of the same graph and another linked list representation.

Left Page:

- Definition: A graph is a non-linear data structure that consists of a set of nodes (vertices) and a set of edges that relate the nodes to each other.
- Graph representation: A graph G can be represented as $G = (V, E)$.
- Set representation:
 - $V = \{v_1, v_2, v_3, v_4, v_5, v_6, v_7\}$
 - $E = \{(v_1, v_2), (v_1, v_3), (v_2, v_4), (v_2, v_5), (v_3, v_4), (v_4, v_5), (v_5, v_6), (v_6, v_7)\}$
- Linked list representation: A series of boxes representing nodes and their neighbors.
 - $v_1 \rightarrow v_2 \rightarrow v_3$
 - $v_2 \rightarrow v_4 \rightarrow v_5$
 - $v_3 \rightarrow v_4 \rightarrow v_6$
 - $v_4 \rightarrow v_7 \rightarrow v_2 \rightarrow v_3$
 - $v_5 \rightarrow v_7 \rightarrow v_2$
 - $v_6 \rightarrow v_7 \rightarrow v_3$
 - $v_7 \rightarrow v_4 \rightarrow v_5 \rightarrow v_6$

Right Page:

- Matrix representation: A 7x7 adjacency matrix for the graph.

	v_1	v_2	v_3	v_4	v_5	v_6	v_7
v_1	0	1	1	0	0	0	0
v_2	1	0	0	1	1	0	0
v_3	1	0	0	1	0	0	0
v_4	0	1	1	0	0	0	0
v_5	0	1	0	1	0	0	0
v_6	0	0	0	1	1	0	0
v_7	0	0	0	1	1	1	1
- Another linked list representation:
 - $v_1 \rightarrow v_2 \rightarrow v_3$
 - $v_2 \rightarrow v_4 \rightarrow v_5$
 - $v_3 \rightarrow v_4 \rightarrow v_6$
 - $v_4 \rightarrow v_7 \rightarrow v_2 \rightarrow v_3$
 - $v_5 \rightarrow v_7 \rightarrow v_2$
 - $v_6 \rightarrow v_7 \rightarrow v_3$
 - $v_7 \rightarrow v_4 \rightarrow v_5 \rightarrow v_6$