VIGNAN'S NIRULA
INSTITUTE OF TECHNOLOGY & SCIENCE FOR WOMEN
(Approved by AICTE, New Delhi & Affiliated to JNTU Kakinada)
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Department of Information Technology

Innovative Teaching Practices

Faculty Name : Dr. K. V. S. S. Rama Krishna, Dr. K. Venkateswara Rao
Course Name : Compiler Design
Class : III B. Tech I Semester
Academic Year : 2021-2022
Title of the Topic : Machine-Independent Optimizations
Activity Name : One-Minute Summary

Objective:

To engage students in actively summarizing their understanding of file systems in UNIX/Linux and Windows within a minute, focusing on structure, functionalities, and performance differences.

Activity Steps:

1. **Introduction (5-10 minutes):**

    - **Topic Overview**: Briefly explain the key concepts of **Machine-Independent Optimizations** in the context of data-flow analysis.
    - **Optimization Techniques**:

        - **Constant Propagation**: Explain how constant values are substituted into expressions to simplify computations.
        - **Partial-Redundancy Elimination**: Discuss how redundant computations can be eliminated to enhance performance without changing the program's result.
        - **Role of Loops in Flow Graphs**: Describe the importance of loops in flow graphs and how loop optimizations (like loop unrolling and invariant code motion) help improve program efficiency.

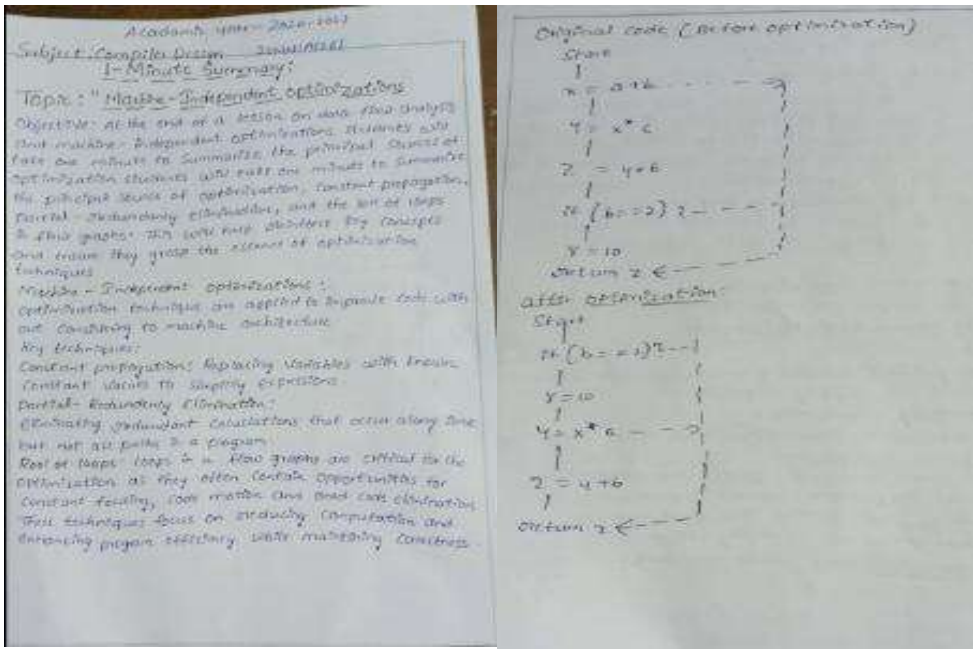
    - **General Goal**: Emphasize that these techniques help improve the performance of programs across different machine architectures, making them **machine-independent**.

2. **One-Minute Summary Activity:**

- **Instructions**: At the end of the session, ask students to take a **one-minute test** to respond to the following questions:
    1. What is **constant propagation**, and how does it optimize programs?
    2. Explain the concept of **partial-redundancy elimination** and its impact on program performance.

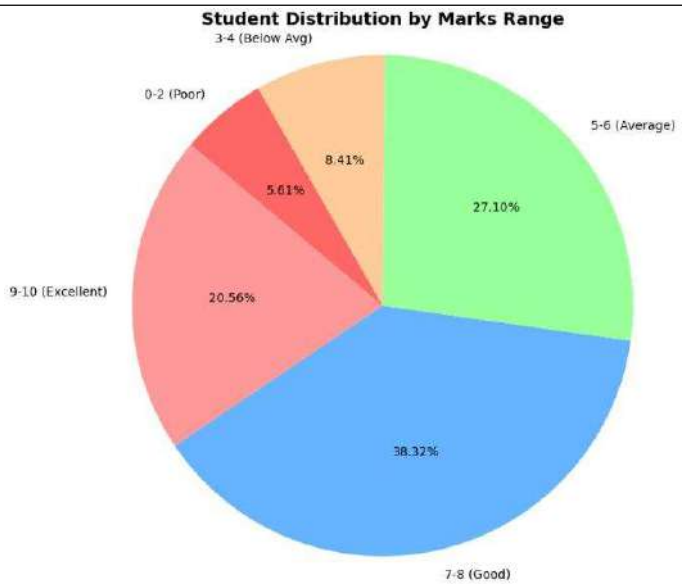
3. Discuss the **role of loops** in flow graphs and how they affect optimization techniques.

Screenshot of the Practice:



Assessment Analysis

Marks Range	Number of Students	Percentage
9-10 (Excellent)	22	20.56%
7-8 (Good)	41	38.32%
5-6 (Average)	29	27.10%
3-4 (Below Avg)	9	8.41%
0-2 (Poor)	6	5.61%
Total	107	100%



Conclusion

The activity emphasized machine-independent optimization techniques, such as constant propagation, partial-redundancy elimination, and loop optimizations. It helped students understand how to improve program efficiency in a machine-agnostic way for better cross-platform performance.

Signature of the Faculty **Head of the Department**