VIGNAN'S NIRULA
INSTITUTE OF TECHNOLOGY & SCIENCE FOR WOMEN
(Approved by AICTE, New Delhi & Affiliated to JNTU Kakinada)
Vignan Avenue, Peda Palakaluru, Guntur - 522009
Department of Information Technology

Innovative Practice

Faculty Name : Mr.T.V.Vamsi Krishna,Mrs.G.R.P.Kumari
Course Name : Advanced Data Structures
Class : II B.Tech I Semester
Academic Year : 2024-2025
Title of the Topic : Divide and Conquer
Activity Name : Think-Pair-Share

Objective of the Activity:

The goal of the Think-Pair-Share activity is to foster collaborative learning and encourage students to actively engage with the Divide and Conquer paradigm in the context of advanced data structures.

Activity Procedure:

Step 1: Think (5-10 minutes)

1. Present a brief introduction to Divide and Conquer, its principles, and examples (like Merge Sort, Quick Sort, or Binary Search).
2. Provide each participant with a problem statement related to Divide and Conquer. Example problems:

    - Solve an array sorting problem using Merge Sort.
    - Find the closest pair of points in a 2D plane using Divide and Conquer.
    - Implement Binary Search on a sorted array.

3. Ask participants to individually think about how the problem can be divided into smaller sub-problems and solved recursively.
4. Encourage them to jot down their thoughts and break the problem into key steps:

    - **Divide**: How can the problem be split?
    - **Conquer**: How are sub-problems solved?
    - **Combine**: How are solutions merged?

Step 2: Pair (10-15 minutes)

1. Pair participants with a partner (or form small groups of 3).
2. In their pairs, they will:

    - Compare their individual approaches.
    - Discuss similarities and differences in their strategies.
    - Identify the strengths of each approach and refine their solution together.

2. Provide guiding questions:

- Are there alternative ways to divide the problem?
- How can recursion be used effectively in this solution?
- Is the solution efficient in terms of time and space complexity?

3. Encourage pairs to write down a combined step-by-step solution and justify their decisions.

Step 3: share (10-15 minutes)

1. Each pair/group presents their solution to the class by pasting their solution on a board (physical or digital).
2. Solutions should include:

    - The problem statement.
    - The "Divide," "Conquer," and "Combine" steps.
    - An analysis of time and space complexity.
    - Any challenges or alternate approaches they discussed.

3. Allow other groups to review the solutions and provide constructive feedback or ask questions.

Debrief and Wrap-Up (5-10 minutes)

- Summarize key insights from the activity:

    - Highlight how Divide and Conquer simplifies complex problems.
    - Discuss real-world applications (e.g., database indexing, computer graphics, or network optimization).

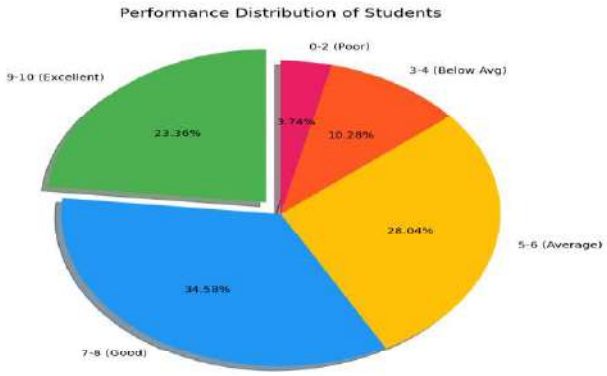
- Emphasize the importance of breaking problems into smaller, manageable pieces and combining them effectively.
- Provide additional resources or practice problems for further learning.

Screenshot of the Practice



Assessment Analysis

Marks Range	Number of Students	Percentage
9-10 (Excellent)	25	23.36%
7-8 (Good)	37	34.58%
5-6 (Average)	30	28.04%
3-4 (Below Avg)	11	10.28%
0-2 (Poor)	4	3.74%
Total	107	100%



Conclusion of Think-Pair-Share Activity

Divide and Conquer is a fundamental algorithmic paradigm that efficiently solves complex problems by breaking them into smaller sub problems, solving each independently, and then combining their results. This approach is widely applicable across various domains, including sorting, searching, optimization, and computational geometry.

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