



# RAMCO INSTITUTE OF TECHNOLOGY

Approved by AICTE, New Delhi & Affiliated to Anna University

NAAC Accredited with 'A+' Grade & An ISO 9001: 2015 Certified Institution

NBA Accredited UG Programs: CSE, EEE, ECE and MECH

**Department of Artificial Intelligence and Data Science**

**Academic Year 2025 – 2026 (Odd Semester)**

**Degree, Semester & Branch:** B.Tech ,V & Artificial Intelligence and Data Science

**Course Code & Title:** CS25C01 & Computer Programming:C

**Name of the Faculty member (s):** S.Pradeepha

### **Innovative Practice Description**

- **Unit / Topic:** Module 4 / Arrays and Pointers
- **Course Outcome:** CO4
- **Topic Learning Outcome:** TLO 63
- **Activity Chosen:** Memory Visualization
- **Justification:**

The concept of an *array of pointers* is abstract and often confusing for students. The **Memory Explorer** activity helps students visually map variables, their addresses, pointer addresses, and dereferenced values. By manually drawing memory maps, students clearly understand:

- how pointer arrays store addresses
- how memory locations are traced
- how dereferencing works
- how pointer arithmetic behaves

This visual and interactive approach improves comprehension and retention.

- **Time Allotted for the Activity:** 45 Minutes
- **Details of the Implementation:**
  1. Students were given snippet code
  2. They were asked to manually trace the program without using a compiler.
  3. Imaginary memory addresses were assigned as:
    - &a = 1000
    - &b = 1004
    - &c = 1008
  4. Students drew the **memory map of normal variables:**

Variable	Address	Value
a	1000	10
b	1004	20
c	1008	30

4. Students then created a **pointer array memory table**:

Pointer	Address of Pointer	Value Stored (Address)	*Value (Dereferenced)
p[0]	2000	1000	10
p[1]	2004	1004	20
p[2]	2008	1008	30

5. Students visually connected:

- Each pointer element  $p[i] \rightarrow$  its respective integer variable (a, b, c)
- Arrows showing how pointer addresses lead to data values
- Labels for p, \*p, and \*(p+i)

This visualization strengthened their ability to interpret pointer expressions.

• **Learning Outcome:**

- Explain the concept of an array of pointers and how pointer elements store memory addresses.
- Illustrate the memory layout of variables, pointer addresses, and the values stored in address locations.
- Trace execution of pointer-based code and interpret expressions such as  $p[i]$ ,  $*p[i]$ , and  $*(p + i)$ .
- Differentiate between pointer address, address stored inside the pointer, and dereferenced value.
- Apply pointer arithmetic to identify correct memory access patterns in C programs.

• **CO – PO / PSO mapping:**

CO	PO1	PO2	PO4	PO5	PO8	PSO1
CO5	3	2	3	3	2	3

(1 – Low      2 – Moderate      3 – High)

• **PO / PSO mapped:**

Innovative practice	PO1	PO2	PO4	PO5	PO8	PSO1
	3	2	3	3	2	3
<b>Justification for correlation</b>	Uses engineering knowledge to manage and process data using arrays and pointers problems	Analyzes problems involving data storage, retrieval, and manipulation and	Conducts experiments to analyze pointer arithmetic and memory management	Utilizes modern debugging tools to test pointer operations and memory handling	Encourages teamwork in debugging and solving memory-related programming challenges.	Promotes modular and efficient problem-solving skills essential for advanced computing applications

• **Images / Screenshot of the practice:**



int arr = { 200, 100, 105, 102, 202 }		arr = arr	
arr[0] = (*p)[0] :			
p = &arr :			
arr[0] = 200	500 0	*arr = 200	*p[0] = 200
arr[1] = 100	500 2	*arr[1] = 100	*p[1] = 100
arr[2] = 105	500 4	*arr[2] = 105	*p[2] = 105
arr[3] = 102	500 6	*arr[3] = 102	*p[3] = 102
arr[4] = 202	500 8	*arr[4] = 202	*p[4] = 202

arr[0]	arr[1]
200 0	200 2
*p[0] = 10	*p[1] = 20
arr[0] = 10	arr[1] = 20
*arr = 10	*arr[1] = 20
p[0] = 2000	p[1] = 200 2
*p[0] = 200	*p[1] = 100
arr[0] = 20	arr[1] = 200
*arr = 200	*arr[1] = 200
p[0] = 5000	p[1] = 500 2

● **Reflective Critique:**

➤ **Feedback from Students**

Students reported that memory visualization made the concept of array of pointers extremely clear.

They appreciated the step-by-step tracing method and felt confident in interpreting pointer expressions such as p, \*p, and \*(p+i).

➤ **Benefits of the Practice:**

The activity improved students' understanding of:

- pointer addressing
- dereferencing
- memory layout

Students found it easier to answer pointer-related questions in assignments and assessments.

➤ **Challenges Faced:**

- Some students initially struggled with differentiating pointer address vs address stored inside a pointer.
- Required repeated guidance for weaker learners to trace memory correctly.

**References:**

- Yashavant Kanetkar, *Let Us C*, BPB Publications.
- <https://www.geeksforgeeks.org/c/array-of-pointers-in-c/>

**Signature of Faculty Member**

**HOD**



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Department of Artificial Intelligence and Data Science

Academic Year: 2025- 2026 (Odd Semester)

## FEEDBACK

Active Learning Best Practices: Jigsaw Puzzle

Degree, Semester & Branch: I Sem B.Tech. Artificial Intelligence and Data Science.

Course Code & Title: CS25C01 & Computer programming: C

Name of the Faculty member: S. Pradeepha AP/AD

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Topic of discussion: Arrays and Pointers

Topics Covered: Module-4

Date and Time: 7.11.2025 & 10.30 A.M to 11.15 A.M

Google form Link: <https://forms.gle/hckQgwzZfr6uRhaa9>

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### Feedback Questionnaire:

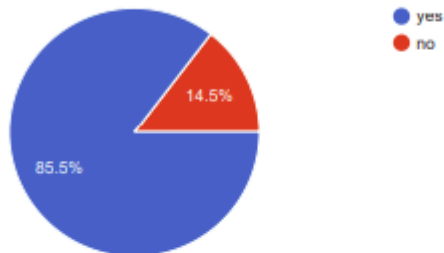
1. Did the plan align with your expectations? Yes no
2. How effectively was the Innovative Practice Plan implemented? **1 2 3 4 5**
3. How well did you understand the Objectives and Purpose of the Innovative Practice Plan?  
**EXCELLENT GOOD SATISFCATORY**
4. Were the necessary resources and support provided for successful implementation?  
**YES, NO**
5. Did you notice any specific Benefits or Changes resulting from this plan? **YES, NO**
6. How were you engaged throughout the Practice Plan? **1 2 3 4 5**
7. Did the plan provide Opportunities for Active Participation and Collaboration? **YES, NO**
8. Whether the Information system has been analysed in a best way using this Innovative Practice Plan? **EXCELLENT GOOD SATISFCATORY**
9. Does this activity learning improve Listening, Thinking, Describing and Problem-- Solving skills? **YES NO**
10. Is the Practice Plan sufficient to understand and discuss the concepts? **YES NO**

## Feedback Analysis

1. Did the plan align with your expectations?

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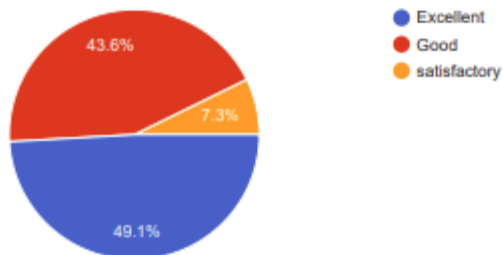
55 responses



2. How effectively was the Innovative Practice Plan implemented?

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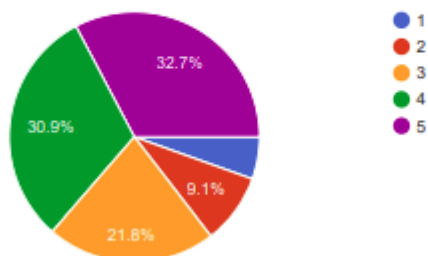
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3. How well did you understand the Objectives and Purpose of the Innovative Practice Plan?

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55 responses

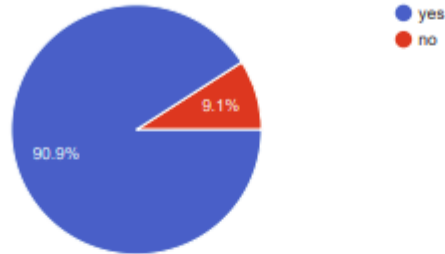


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4. Were the necessary resources and support provided for successful implementation?

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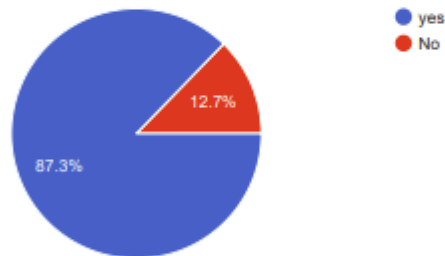
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5. Did you notice any specific Benefits or Changes resulting from this plan?

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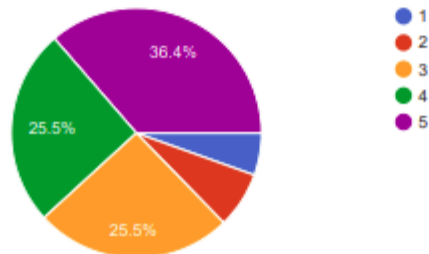
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6. How were you engaged throughout the Practice Plan?

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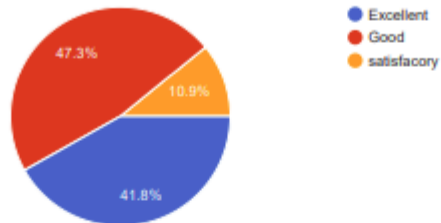
55 responses



8. Whether the Information system has been analysed in a best way using this Innovative Practice Plan?

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55 responses



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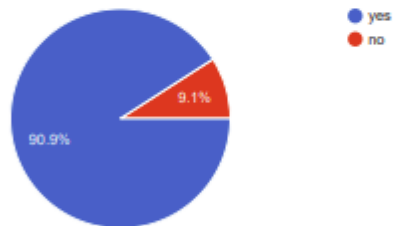
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Innovative Practice -

9. Does this activity learning improve Listening, Thinking, Describing and Problem-Solving skills?

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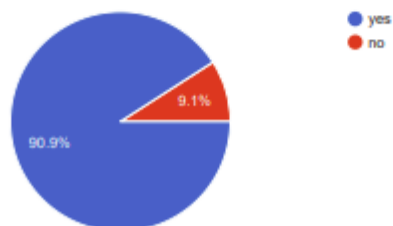
55 responses



10. Is the Practice Plan sufficient to understand and discuss the concepts?

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55 responses



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