Alva'sInstituteofEngineering&Technology
Shobhavana Campus, Mijar, Moodbidri, D.K – 574225 Phone: 08258-262725, Fax: 08258-262726

DEPARTMENTOFCOMPUTERSCIENCE&ENGINEERING
(AccreditedbyNBA,NewDelhi2024-2025)

Organized by

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Twenty-One days of Training on

"Advanced Java Programming"

Date:14th Feb 2025 to 9thMarch2025

For CSE 3rdYear Students

Pre-placement Training Report

Resource Persons

Mr. Idrees Baigh , Mr.Britto,

Mr. Sai Nandu

Trainers, Skill Bout, Mysore

Training Program Coordinator

Dr. Bramha Prakash H. P.

2024-2025

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TRAINING PROGRAM REPORT

A 21-day Java Training Workshop was conducted at Alva's Institute of Engineering and Technology (AIET) for 3rd-year Computer Science and Engineering (CSE) students from 14thFebruary2025to9thMarch2025.OrganizedbytheDepartmentofComputer Science and Engineering, the workshop aimed to provide students with in- and practical experience in Java programming. The workshop was held in two batches, with Batch1conductedin the Internet Lab and Batch2 in the ML Lab,both located on the Ground Floor of the Main Building at AIET. The sessions, conducted by resource persons Mr. Britto and Mr. Sai Nandu, both Associate Trainers from Skill Bout, Mysore, were scheduled for two parts each day: a morning session from 9:00 AM to 1:00 PM and an afternoon session from 2:00 PM to 4:00 PM. The workshop had a total of 197 participants, and each session provided comprehensive lessons on Java programming, including core topics like Object-Oriented Programming, Java Syntax Control Structures, Exception Handling, Collections Framework, and Multi-threading.In addition to theoretical knowledge, students were given hands-on practice to develop their coding skills. The sessions ensure smooth execution and providing support to students. The workshop provided valuable exposure to Java programming, equipping the students with essential skills for their academic growth and future careers in software development. The event was well-received, and the students greatly benefited from the expert guidance of the resource persons, making the workshop a successful and enriching experience.

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Date: PAGE 14th Feb2025

On the first day, 14th February 2025, the morning session began with an introduction to the basics of Java. Resource persons Mr. Britto and Mr. Sai Nandu, both Associate Trainers from Skill Bout, Mysore, started with fundamental concepts such as Java syntax, variables, data types, and operators. The trainers emphasized the importance of understanding these core elements as the foundation for writing effective Java programs. Students were introduced to writing simple Java programs, including basic input/output operations, and were guided through the process of compiling and running Java code.

In the afternoon session, the focus shifted to more hands-on practice. The students were given exercises to solidify their understanding of Java syntax and to get familiar with writing and executing small programs. The trainers also provided insight into the Java development environment, showing students how to use integrated development environments (IDEs) for coding and debugging.

This session laid the groundwork for the training, ensuring that all participants had a clear understanding of Java's core principles, which they would build upon throughout the 21-day program.

In the afternoon session, the students executed code and showed the results. The term Executiontellsthatthetestingfortheproductorapplicationneedstobeexecutedin order to obtain the expected result. After the development phase, the testing phase will take place where the various levels of testing techniques will be carried out and the creation and execution of test cases will take place.

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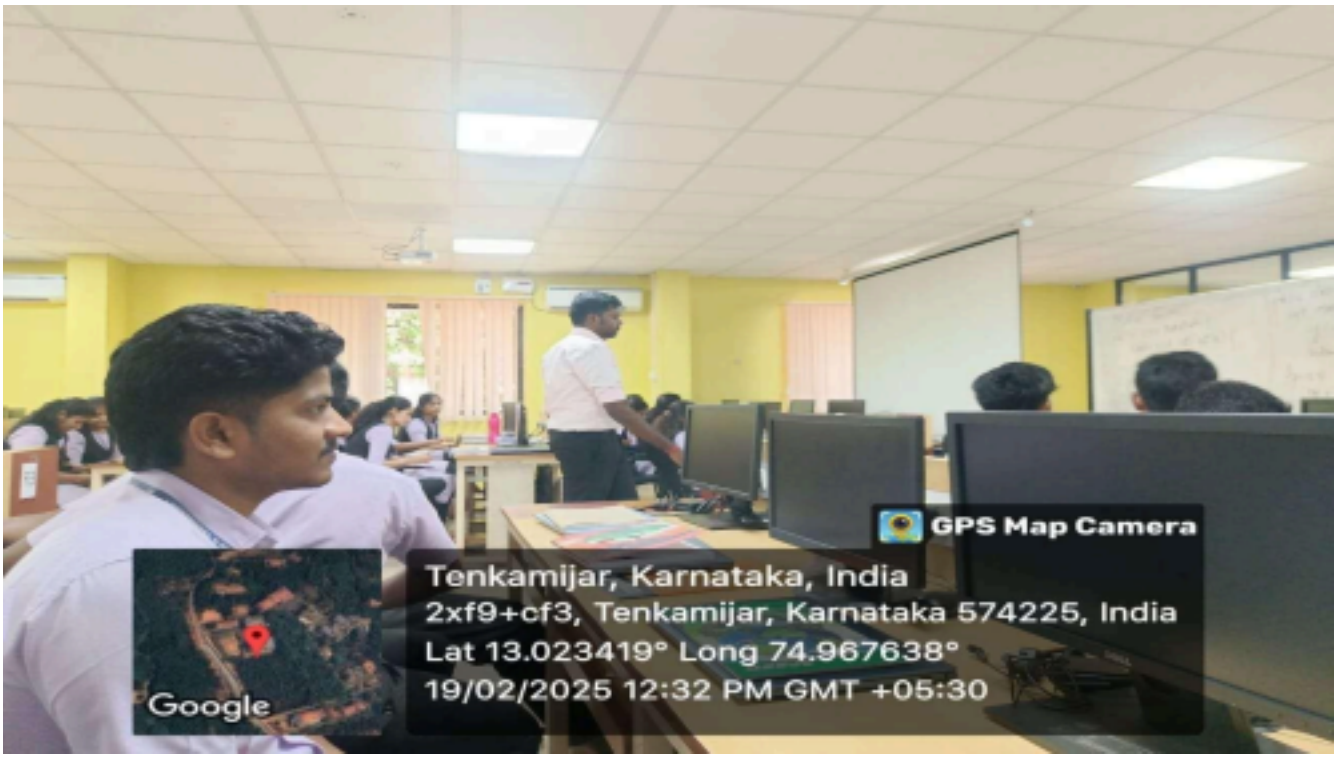
Date:15th Feb2025

On the second day, 15th February 2025, the morning session focused on **loops** and **conditional statements** in Java. Resource persons Mr. Britto and Mr. Sai Nandu began by explaining the core concepts of **if-else**, **switch**, **for**, **while**, and **do-while**
loops. They demonstrated how to use these constructs to control the flow of a program and make decisions based on different conditions. Students were given practical examples to help them understand how loops are used to repeat actions and how conditional statements allow the program to make decisions based on specified criteria. The trainer emphasized the importance of mastering these concepts as they are crucial for building logic and solving real-world programming problems.



In the afternoon session, the students practiced writing code using loops and conditional statements. They worked on exercises where they applied if-else and switch statements to solve problems based on certain conditions. Additionally, they were tasked with using different types of loops to create programs that required repetitive tasks, reinforcing their understanding of these core programming concepts. The trainers also demonstrated debugging techniques, showing students show to troubleshoot common errors in their code related to loops and conditions.

The day's activities were designed to enhance students' problem-solving skills and to give them hands-on experience with Java's control flow mechanisms, setting the stage for more complex programming topics in the upcoming sessions.

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Date: PAGE 17th Feb2025

On the third day, 17th February 2025, the morning session focused on number logic in Java. Resource persons, Mr. Britto and Mr. Sai Nandu, began by explaining various number-based logic problems, such as finding prime numbers, factorials, Fibonacci series, and palindrome numbers. They demonstrated how to implement this logic using different programming techniques and emphasized their practical applications in problem-solving.

Students were given practical examples to help them understand how number logics are applied in real-world scenarios. The trainers highlighted the importance of optimizing logic to improve program efficiency and performance.

In the afternoon session, students practiced writing Java programs to solve number logic problems. They worked on exercises that involved implementing number-based computations, reinforcing the misunderstanding of mathematical logic in programming. The trainers also demonstrated debugging techniques, helping students identify and resolve logical errors in their code.

The day's activities were designed to enhance students' problem-solving skills and logical thinking, providing them with a strong foundation in number-based programming concepts. This session set the stage for more complex programming topics in the

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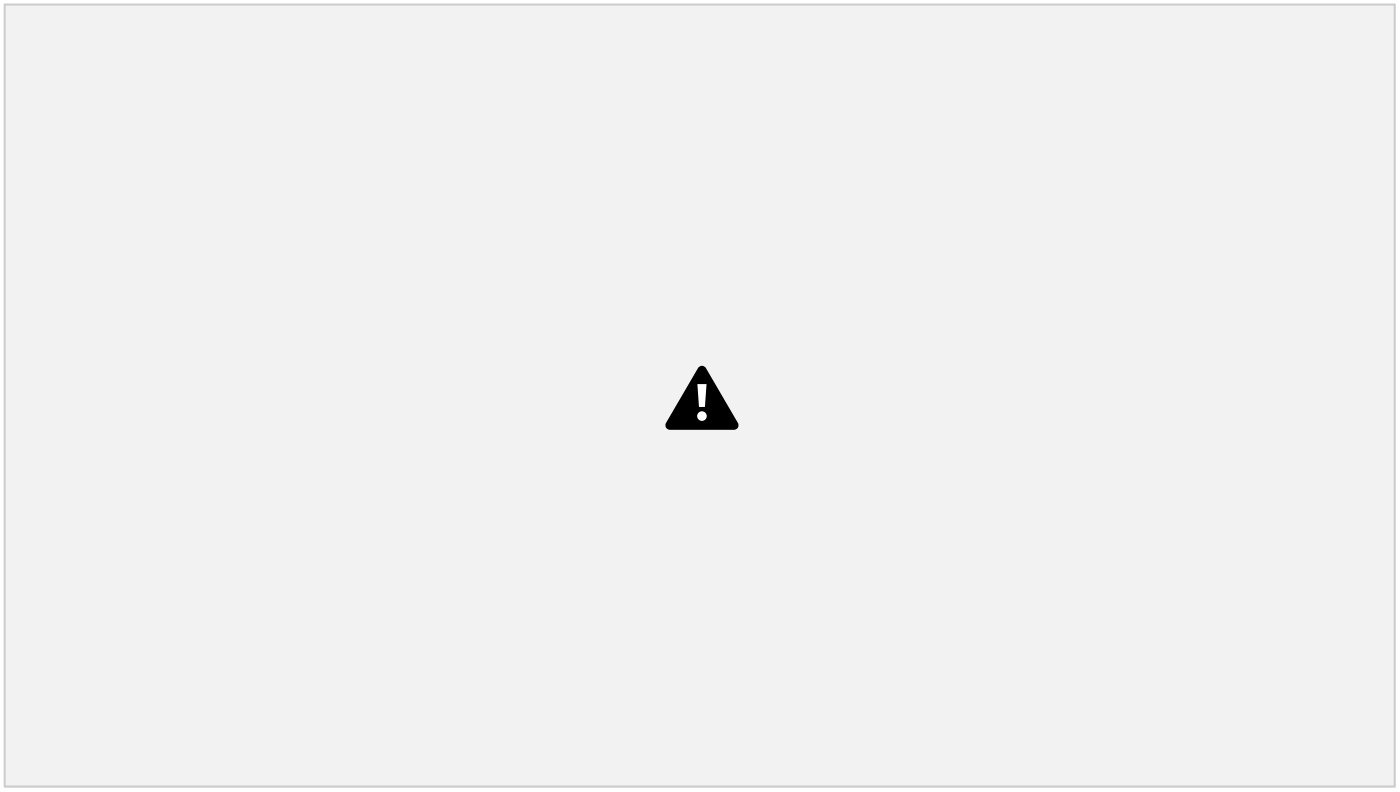
Date:18th Feb2025

On the fourth day, 18th February 2025, the morning session focused on number logics and exercises in Java. Resource persons Mr. Britto and Mr. Sai Nandu introduced various methods for solving number-based logic problems. They covered multiple techniques for identifying prime numbers, computing factorials, generating Fibonacci sequences, and checking palindrome numbers. The trainers emphasized the importance of selecting the most effective method based on efficiency and readability.

Students explored practical examples to understand how different approaches influence performance and

maintainability in real-world scenarios. The trainers also stressed the need for optimizing logic to enhance program execution speed and efficiency.

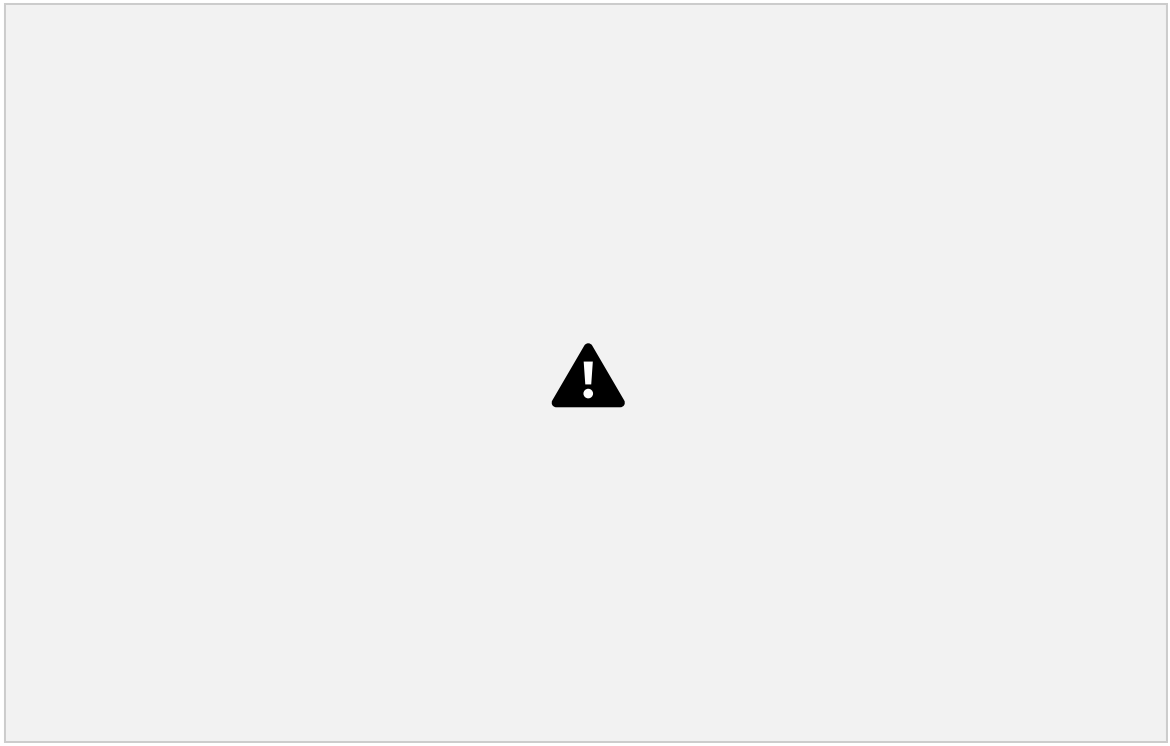


In the afternoon session, students engaged in hands-on coding exercises, applying different methods to solve number logic problems. They experimented with multiple approaches to the same problem, deepening their understanding of algorithm selection and optimization. Additionally, the trainers demonstrated debugging strategies to help students detect and correct logical errors in their programs.

The day's activities aimed to strengthen students' problem-solving abilities and logical reasoning, equipping them with a solid foundation in number-based programming. This session prepared them for tackling more advanced programming topics in the upcoming

On the fifth day, 19th February 2025, the morning session focused on basic pattern problem-solving skills in Java. Resource persons, Mr. Britto and Mr. Sai Nandu, introduced different techniques to create various pattern-based problems using loops and conditional statements. They explained how to construct patterns such as pyramids, triangles, and diamond shapes, emphasizing the logic behind each structure.

Students explored practical examples to understand how loops and nested loops play a crucial role in pattern generation. The trainers highlighted the importance of optimizing logic to improve code efficiency and readability.

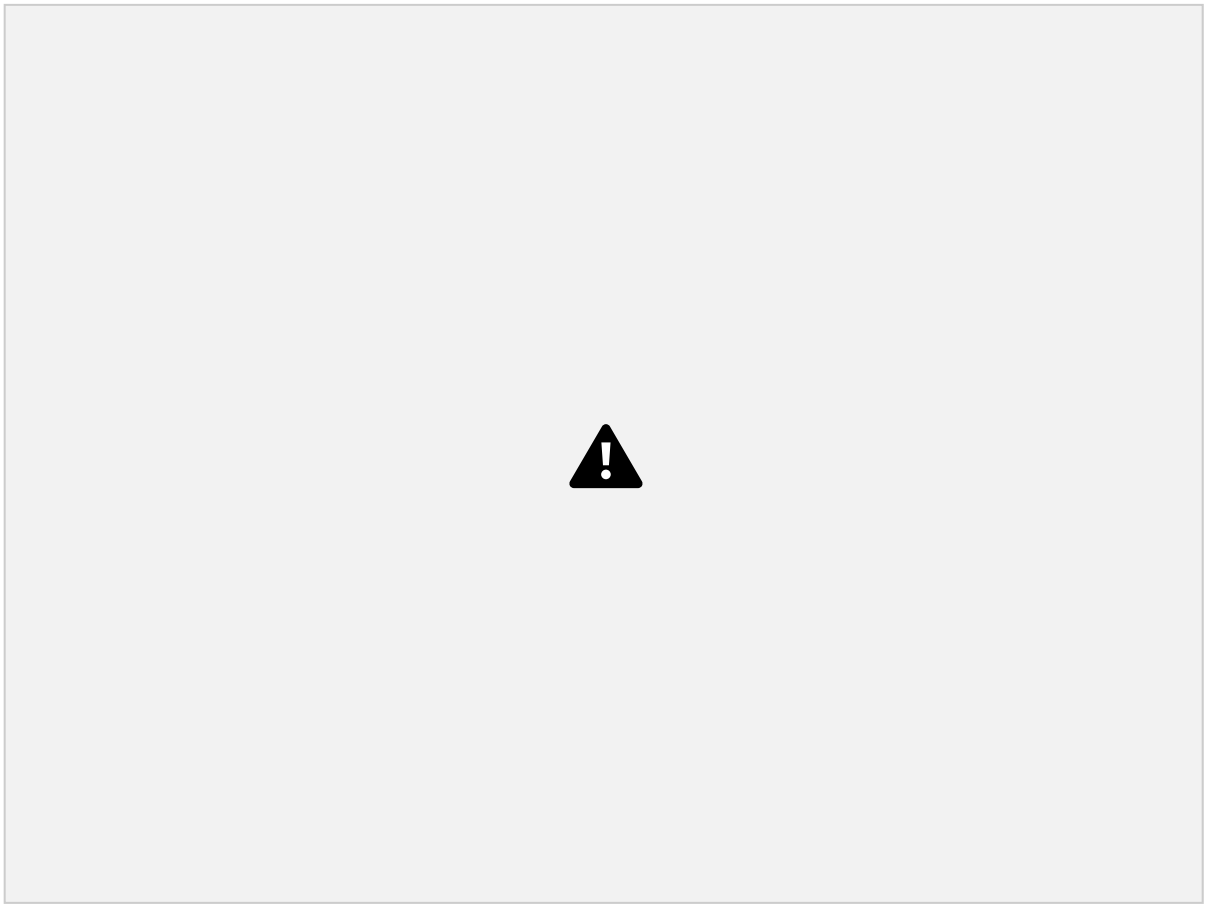


In the afternoon session, students practiced writing Java programs to generate different patterns. They experimented with various approaches to solve pattern problems, reinforcing their logical thinking and problem-solving skills. Additionally, the trainers demonstrated debugging techniques to help students identify and fix errors in their pattern-based programs.

The day's activities aimed to enhance students' ability to break down complex problems into smaller, manageable steps, strengthening their programming foundation. This session set the stage for more advanced programming concepts in the upcoming sessions.

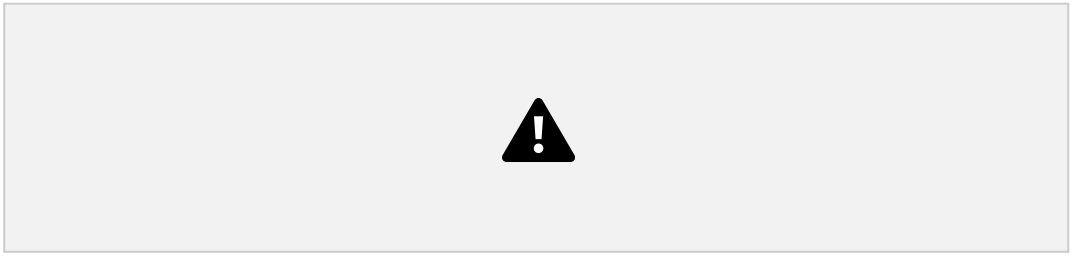
Date:20th Feb2025

On the sixth day, 20th February 2025, the session focused on extensive practice with pattern problems in Java. Resource persons, Mr. Britto & Mr. Sai Nandu, provided nearly 150 pattern-based questions for students to solve, covering a wide range of complexity levels. These exercises were designed to strengthen their understanding of loops, nested loops, and logical thinking.



Throughout the session, students worked on implementing various patterns and refining their problem-solving skills. The trainers actively assisted them, clarifying doubts and providing insights into different approaches to optimize pattern generation. Debugging strategies were also discussed to help students identify and correct errors in their solutions.

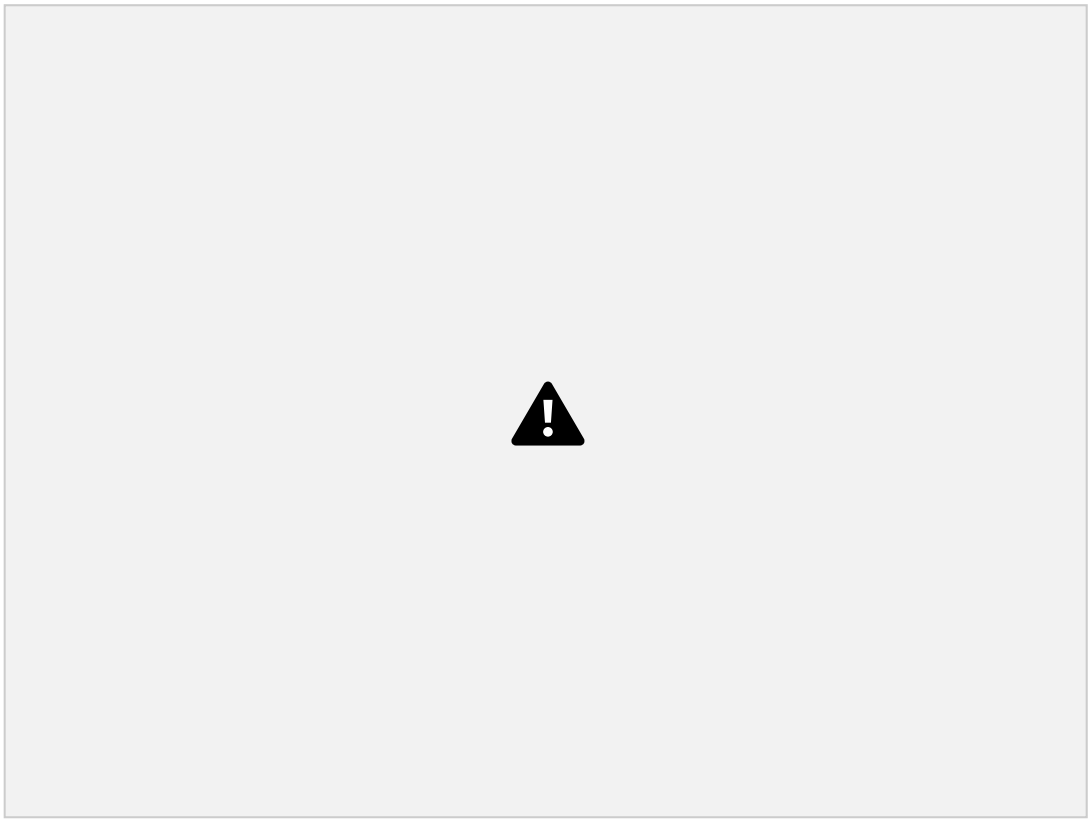
The day's activities aimed to reinforce students' confidence in handling pattern-related programming challenges and improve their coding efficiency. This session served as a strong practice foundation, preparing them for more complex programming topics in the upcoming days



Date:21th Feb2025

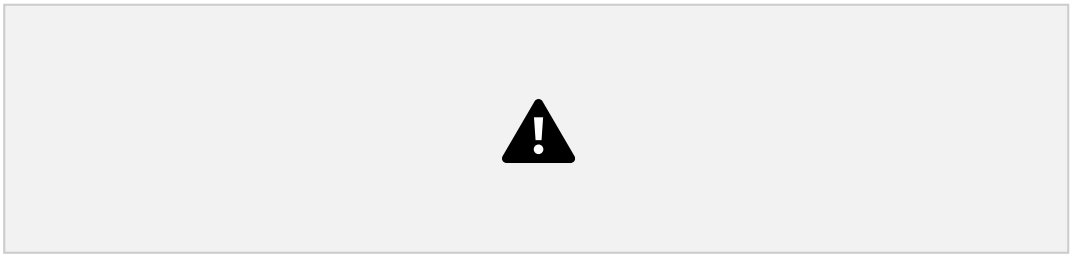
On the seventh day, 21st February 2025, the session focused on the basics of recursion and the memory stack in Java. Resource persons Mr. Britto and Mr. Sai Nandu introduced the fundamental concepts of recursion, explaining how functions call themselves to solve problems in a structured manner. They discussed common use cases such as calculating factorials, generating Fibonacci sequences, and solving tower of Hanoi problems.

Students were also introduced to the concept of the memory stack, learning how recursive function calls are stored and managed. The trainers explained stack overflow errors, emphasizing the importance of base cases to prevent infinite recursion.



In the afternoon session, students practiced writing recursive Java programs and visualizing the memory stack during execution. The trainers guided them through debugging recursive functions and optimizing them for efficiency.

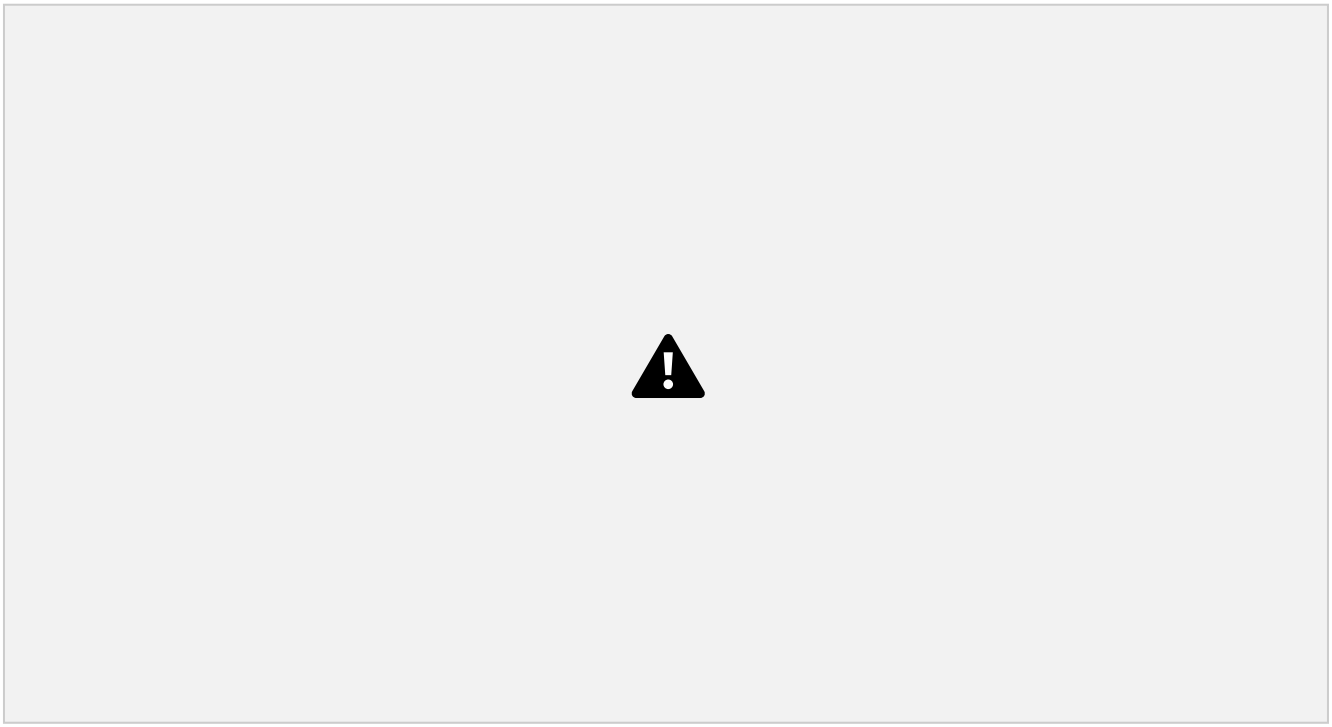
The day's activities aimed to enhance students' understanding of recursion and memory management, laying the groundwork for more advanced programming techniques in the upcoming sessions.



Date:22th Feb2025

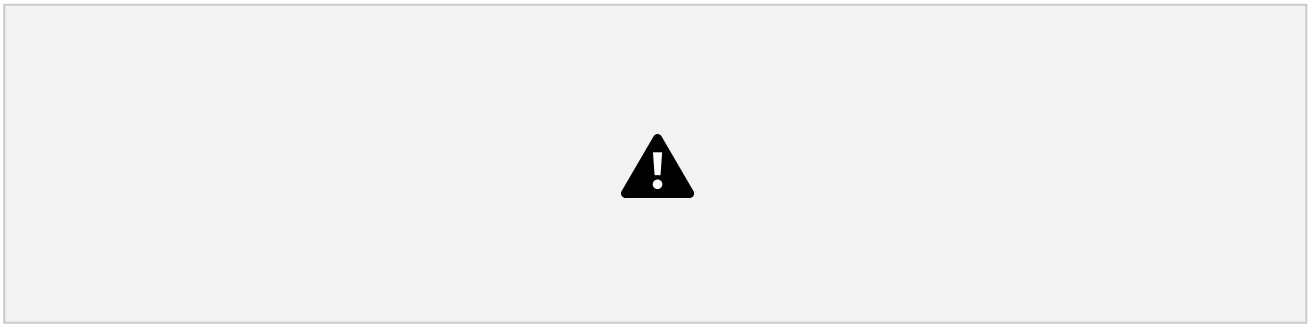
On the eighth day, 22nd February 2025, the session delved deeper into recursion and introduced the basics of backtracking in Java. Resource persons, Mr. Idris, explained advanced recursion concepts, focusing on optimizing recursive functions and understanding different recursion techniques. They demonstrated real-world applications such as solving combinatorial problems, N-Queens, and Sudoku solvers using recursion.

Students were also introduced to backtracking, a powerful technique for solving problems by exploring all possibilities and eliminating incorrect solutions. The trainers explained how backtracking works in recursive algorithms and provided examples like subset generation, permutations, and maze-solving problems.



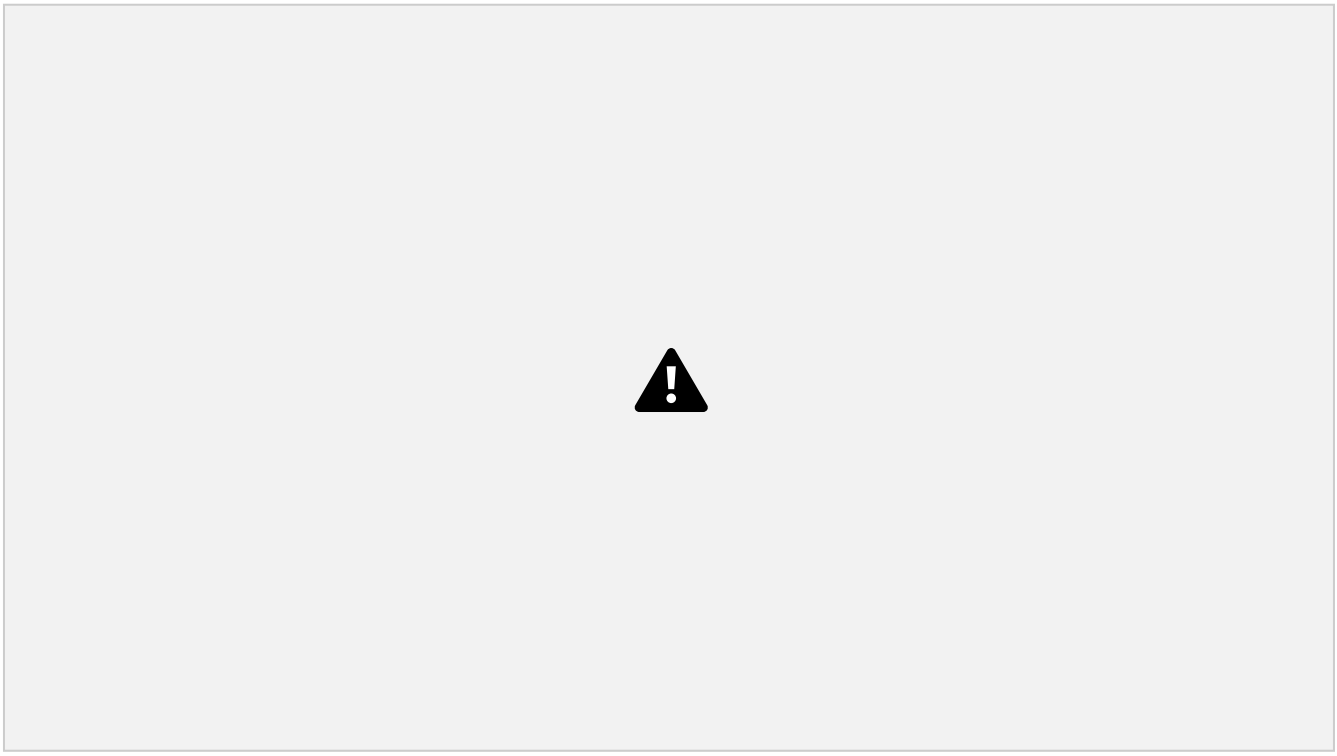
In the afternoon session, students practiced solving 100 recursion-based problems, reinforcing their understanding of recursive logic and backtracking techniques. Thetrainers provided guidance, debugging tips, and optimization strategies to improve efficiency.

The day's activities aimed to enhance students' problem-solving abilities and logical reasoning, setting the foundation for tackling more complex algorithms in future sessions.



On the ninth day, 23rd February 2025, the session focused on 1D arrays and an introduction to 2D array concepts in Java. Resource persons Mr.Britto and Mr.Sai Nandu explained the fundamentals of arrays, including declaration, initialization, and traversal. They covered various problems involving 1D arrays, such as searching, sorting, and performing mathematical operations on array elements.

Students were given practical examples to understand how arrays store and manipulate data efficiently. The trainers emphasized the importance of arrays in problem-solving and demonstrated different techniques to optimize array-based solutions.

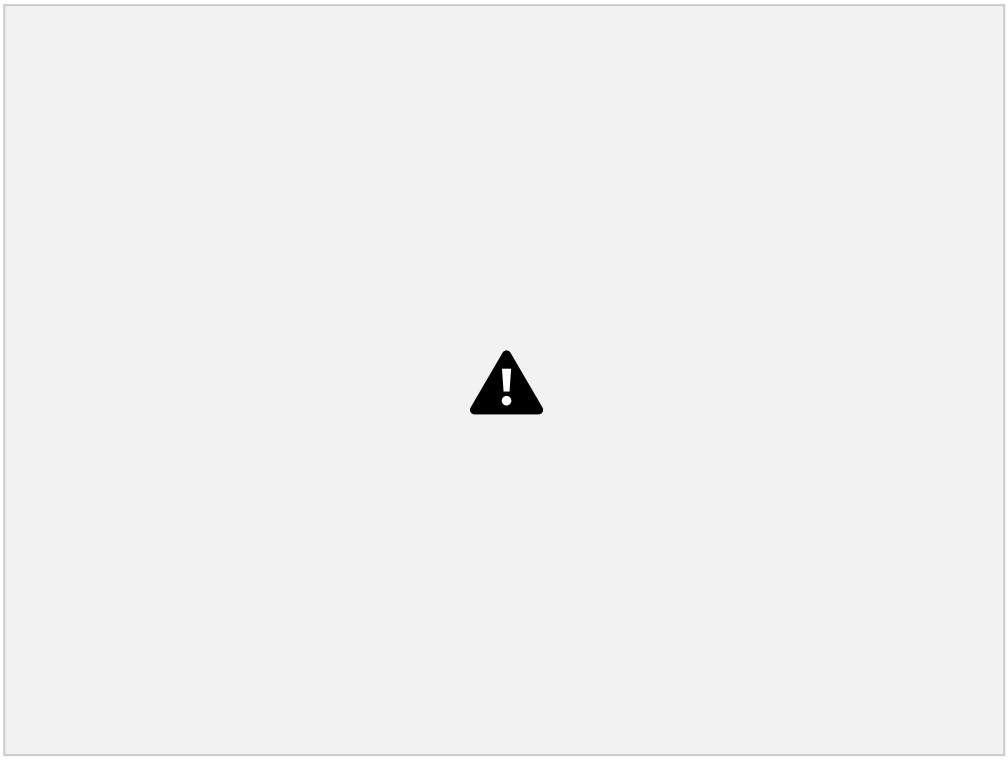


In the afternoon session, students practiced solving a wide range of 1D array problems to reinforce their understanding. Additionally, the trainers introduced the basics of 2D arrays, explaining their structure, representation in memory, and common use cases. Simple matrix operations were demonstrated to give students a foundational understanding of working with two-dimensional data structures.

The day's activities aimed to strengthen students' grasp of array-based problem-solving, preparing them for more advanced topics in data structures and algorithms in upcoming

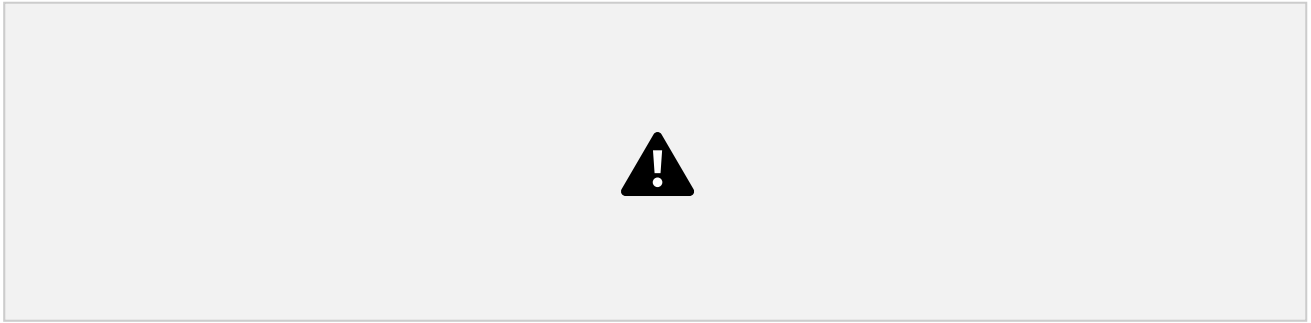
On the tenth day, 24th February 2025, the session focused on string concepts in Java. Resource persons Mr. Britto and Mr. Sai Nandu explained fundamental string operations, including finding the length of a string, converting a string into a character array, and reversing a string. They also covered various string manipulation techniques such as concatenation, substring extraction, and case conversion.

Students were provided with practical examples to understand how strings are handled in Java and how different operations impact performance. The trainers emphasized the importance of string handling in programming and demonstrated efficient methods to process textual data.



In the afternoon session, students practiced solving string-related problems, reinforcing their understanding of string operations and manipulation techniques. The trainers guided them through debugging common string-related issues and optimizing string- handling logic for efficiency.

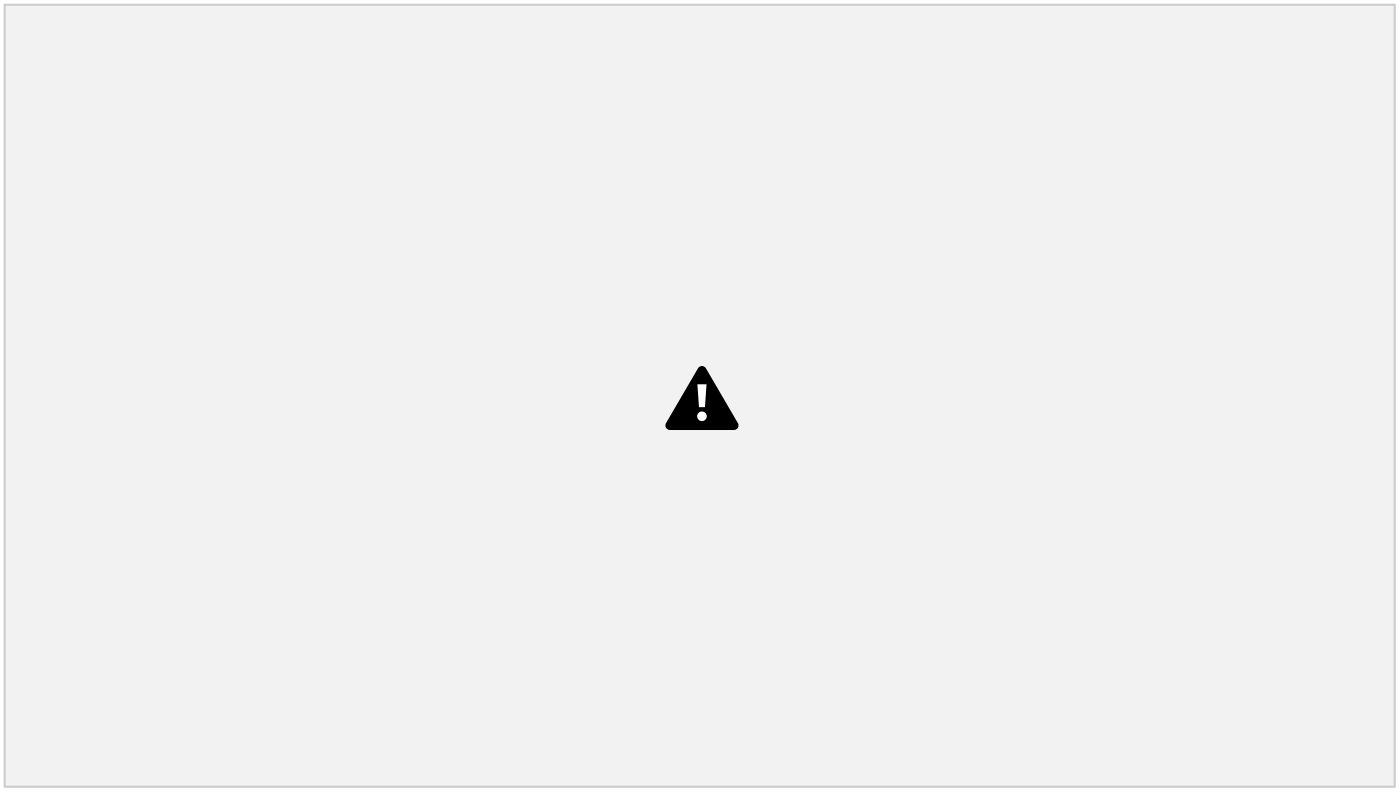
The day's activities aimed to enhance students' understanding of string processing, preparing them for more advanced programming concepts in the upcoming sessions.



On the eleventh day, 25th February 2025, the session focused on the Collection Framework in Java, specifically ArrayList and the differences between arrays and ArrayLists. Resource persons, Mr. Britto and Mr. Sai Nandu, explained the fundamental concepts of the Collection Framework and its significance in Java programming.

Students learned about ArrayLists, including how they differ from traditional arrays in terms of dynamic resizing, flexibility, and built-in methods. The trainers demonstrated how to perform operations such as adding, removing, and modifying elements in an ArrayList and compared them with similar operations in

arrays.



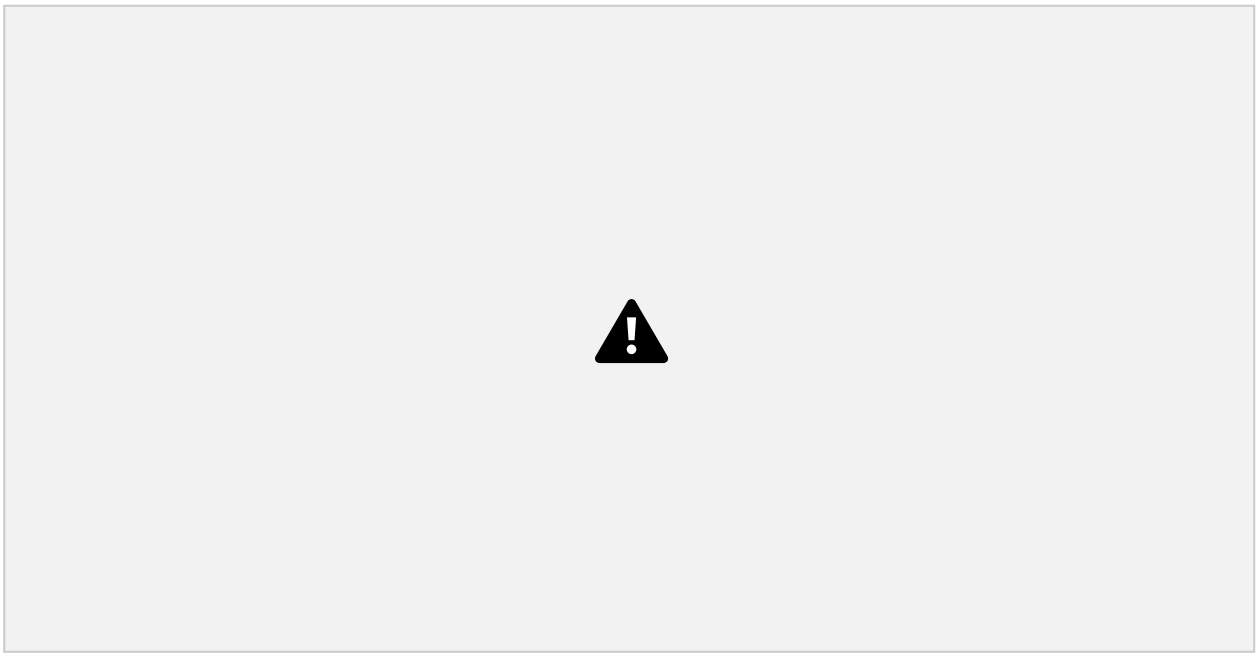
In the afternoon session, students practiced implementing ArrayLists, working on exercises that involved various CRUD (Create, Read, Update, Delete) operations. The trainers provided insights into when to use arrays versus ArrayLists based on performance and memory considerations. Debugging techniques for handling common errors related to collections were also discussed.

The day's activities aimed to enhance students' understanding of dynamic data structures, preparing them for more advanced topics in the Java Collection Framework in the upcoming sessions.

On the twelfth day, 27th February 2025, the session focused on Stack operations, both manual implementation and built-in Stack classes from the Java Collection Framework. Resource persons Mr. Britto and Mr. Sai Nandu introduced the fundamental concepts of stacks, explaining the Last In, First Out (LIFO) principle and its real-world applications.

Students learned how to manually implement stack operations such as push, pop, peek, and is

Empty using arrays and linked lists. The trainers then introduced the built-in Stack class in Java, demonstrating how to perform the same operations efficiently using the Collection Framework.



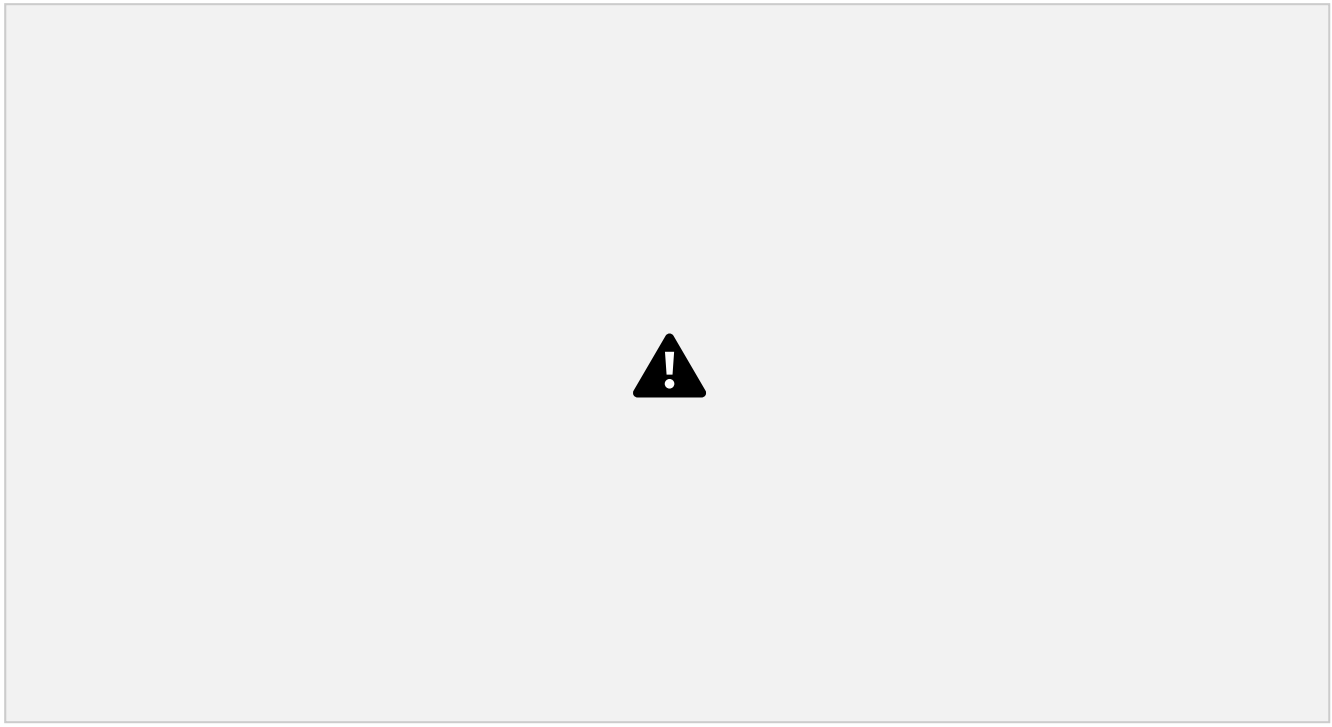
In the afternoon session, students practiced implementing stacks both manually and using Java's built-in Stack class. They worked on exercises that involved solving real-world problems using stacks, such as balancing parentheses, undo-redo operations, and evaluating postfix expressions. The trainers also provided debugging techniques for handling stack-related errors.

The day's activities aimed to strengthen students' understanding of stack data structures, preparing them for more advanced topics in data structures and algorithms

Date:28th Feb2025

On the Thirteenth day, 28th February 2025, the session focused on Stack operations, both manual implementation and built-in Stack classes from the Java Collection Framework. Resource persons Mr. Britto and Mr. Sai Nandu introduced the fundamental concepts of stacks, explaining the Last In, First Out (LIFO) principle and its real-world applications.

Students learned how to manually implement stack operations such as push, pop, peek, and is Empty using arrays and linked lists. The trainers then introduced the built-in Stack class in Java, demonstrating how to perform the same operations efficiently using the Collection Framework.



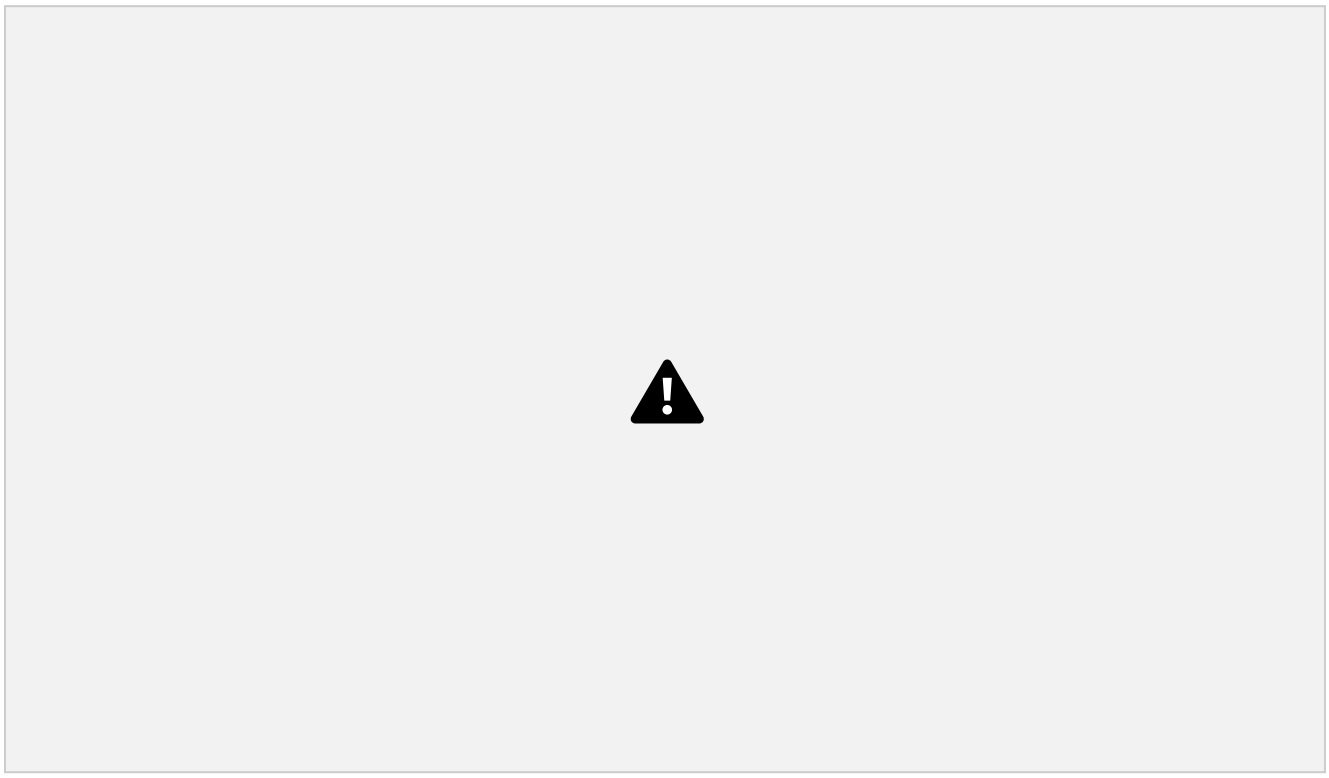
In the afternoon session, students practiced implementing stacks both manually and using Java' s built-in Stack class.They worked on exercises that involved solving real- world problems using stacks, such as balancing parentheses, undo-redo operations, and evaluating postfix expressions. The trainers also provided debugging techniques for handling stack-related errors.

The day's activities aimed to strengthen student's understanding of stackdata structures, preparing them for more advanced topics in data structures and algorithms in upcoming sessions.

Date:1st March2025

On the fourteenth day, 1st March 2025, the session focused on solving stack and queue- related problems from platforms like LeetCode and GeeksforGeeks. Resource persons Mr. Britto and Mr. Sai Nandu provided a variety of challenging problems that tested students' understanding of stacks and queues, including their applications in real-world scenarios.

Students worked through problems covering stack operations such as balancing parentheses, next greater element, and evaluating expressions. Similarly, they tackled queue-related challenges, including implementing sliding window maximum, task scheduling, and circular queue operations. The trainers assisted students in debugging their solutions and optimizing their approaches for better efficiency.



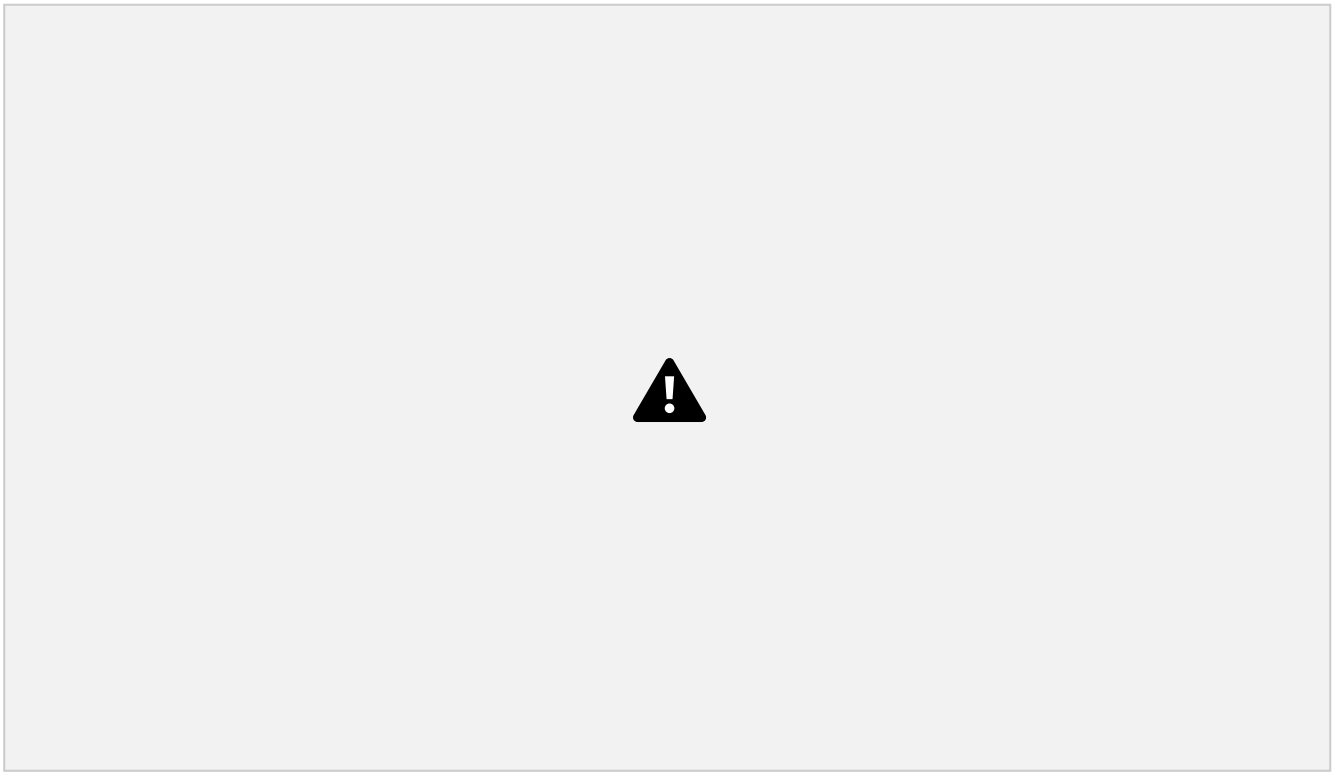
In the afternoon session, students continued solving problems, with the trainers clarifying doubts and providing insights into different problem-solving strategies. They also discussed time and space complexity considerations to help students write more optimized code.

The day's activities aimed to strengthen students' problem-solving skills with stacks and queues, enhancing their ability to tackle complex data structure challenges in future programming tasks.

Date:2nd March2025

On the fifteenth day, 2nd March 2025, the session covered all Collection Framework interfaces and their operations in Java. Resource persons Mr. Britto and Mr. Sai Nandu explained the key interfaces such as List, Set, and Queue, detailing their functionalities and differences.

Students learned about essential operations like add, remove, set, and update for various data structures, including stacks, queues, and ArrayLists. The trainers demonstrated real-world use cases and performance considerations when choosing a specific collection type.



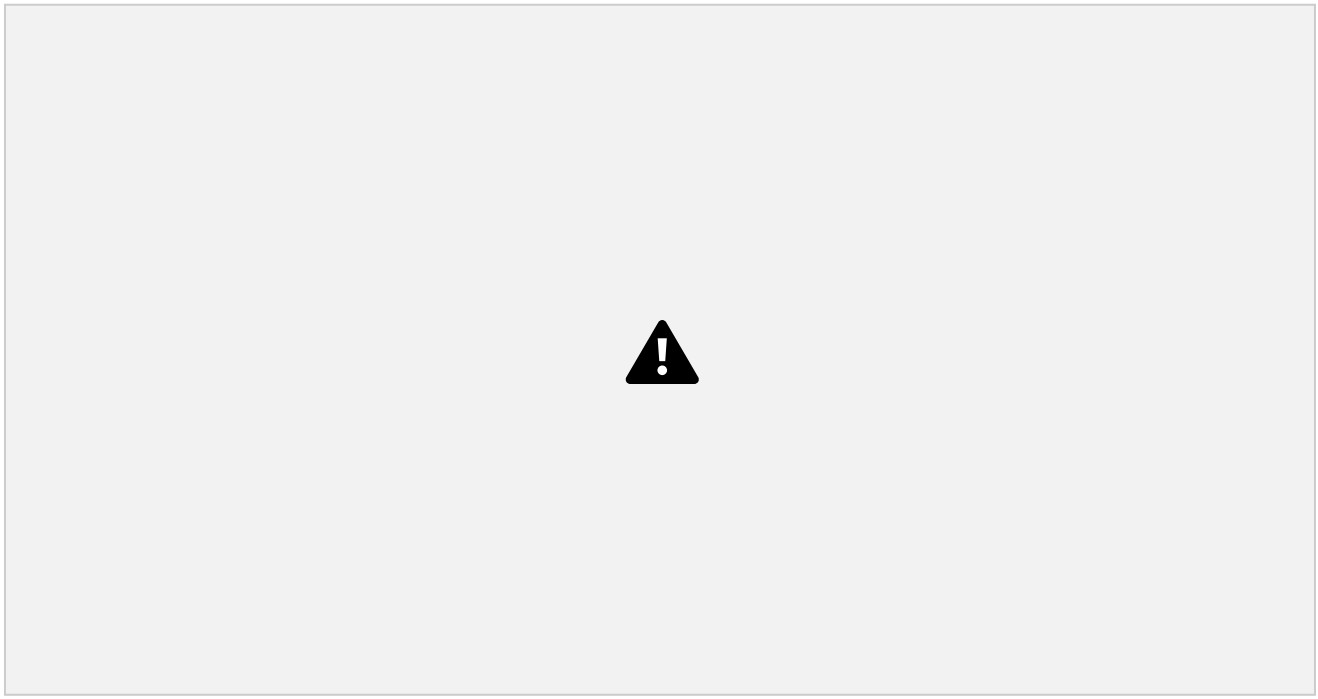
In the afternoon session, students practiced implementing different Collection Framework interfaces, working on exercises that reinforced their understanding of efficient data handling. The trainers guided them in optimizing their implementations and debugging common issues.

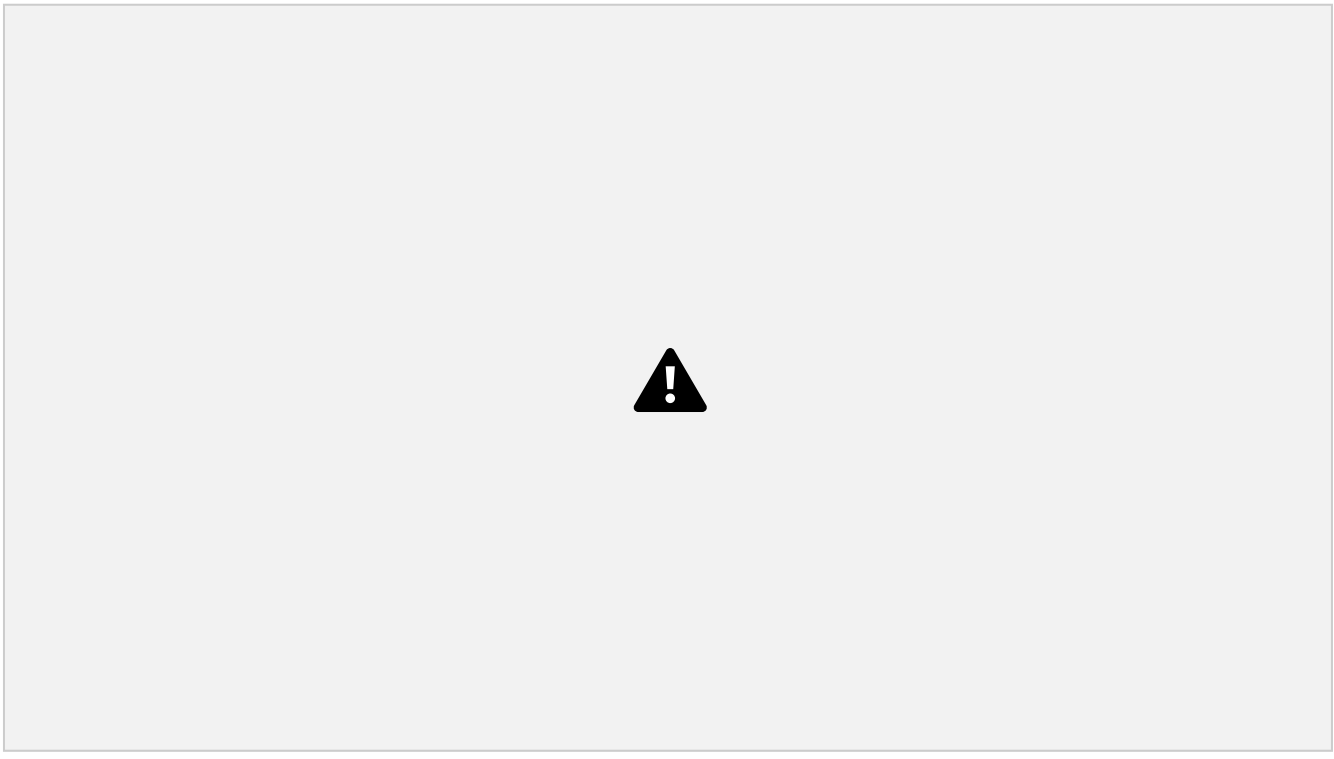
The day's activities provided students with a comprehensive understanding of Java's Collection Framework, preparing them for advanced data structure manipulations in upcoming sessions.

Date:3rdMarch2025

On the sixteenth day, 3rd March 2025, the session focused on understanding Linked Lists and performing various operations on them. Resource persons Mr.Britto and Mr. Sai Nandu introduced the concept of LinkedLists, explaining their advantages over arrays, such as dynamic memory allocation and efficient insertion and deletion.

Students learned how to add and delete nodes at different positions in a Linked List, including at the beginning, at the end, and at a specified position. The trainers demonstrated different approaches for implementing these operations and discussed the underlying memory structure.





In the afternoon session, students practiced implementing Linked Lists in Java, writing code to insert, delete, and traverse nodes efficiently. The trainers guided them through debugging techniques and optimization strategies to improve performance.

The day's activities aimed to provide students with a strong foundation in Linked Lists, preparing them for more advanced data structure topics in future sessions.

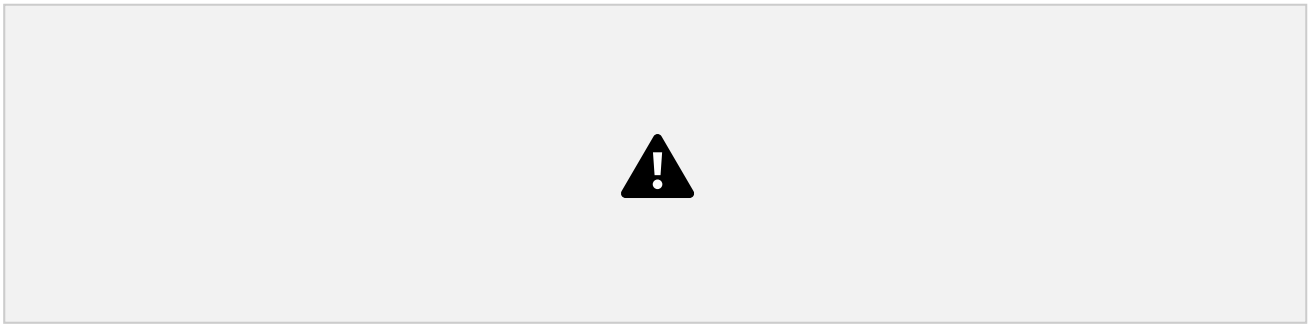
On the seventeenth day, 4th March 2025, the session covered all fundamental topics related to Singly Linked Lists. Resource persons Mr. Britto and Mr. Sai Nandu explained how to search for elements, print linked list data, and traverse through nodes efficiently.

Students learned different techniques for iterating through a linked list and explored methods to optimize searching operations. The trainers provided insights into real-world applications of singly linked lists and their significance in data structures.

In the afternoon session, students practiced writing Java programs to implement searching, printing, and traversing operations in a Singly Linked List. The trainers assisted in debugging issues and optimizing code for better performance.

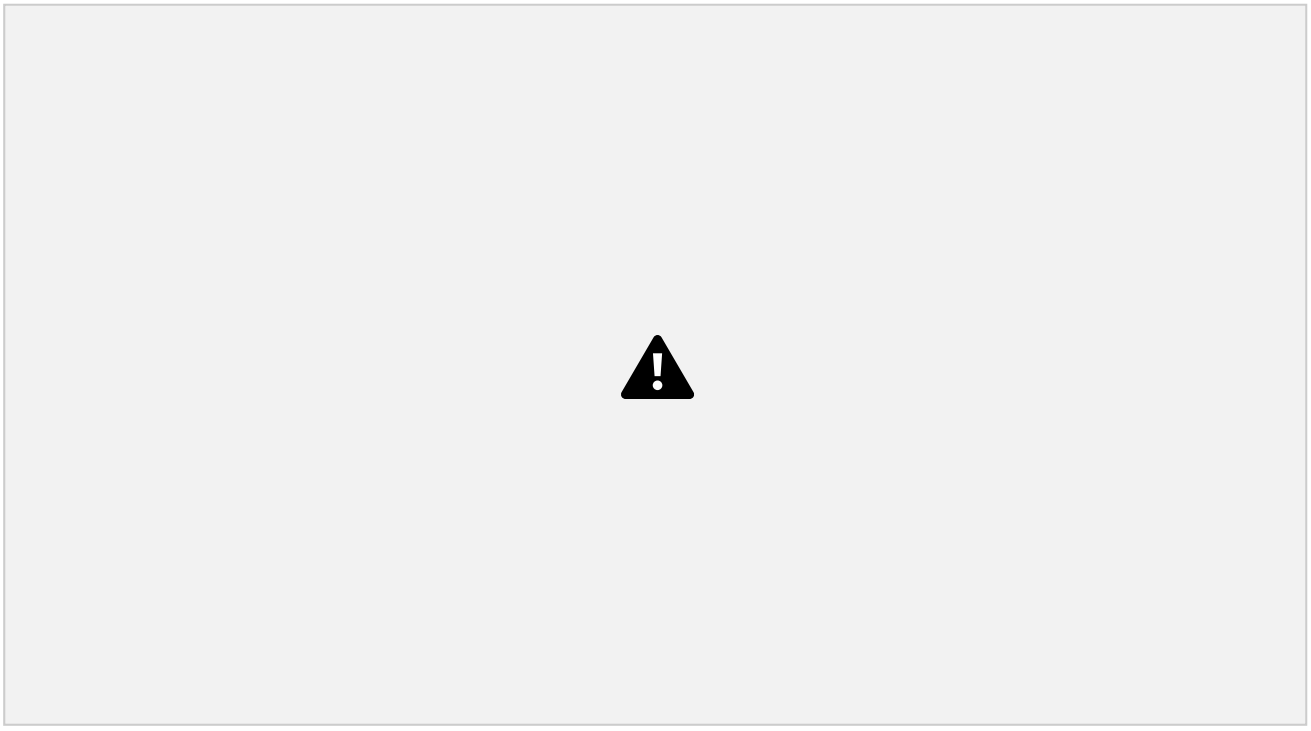
The day's activities reinforced student's understanding of linked list operations, setting the stage for learning more complex variations like doubly linked lists and circular linked lists in the upcoming

sessions.



On the eighteenth day, 5th March 2025, the session covered all fundamental topics related to Circular Linked Lists. Resource persons Mr.Britto and Mr.SaiNandu explained the structure of circular linked lists, their advantages over singly linked lists, and how they enable continuous traversal.

Students learned different techniques for implementing circular linked lists and explored real-world applications where they are useful. The trainers demonstrated how to add, delete, and traverse nodes in a circular linked list efficiently.



In the afternoon session, students practiced writing Java programs to implement circular linked lists and performed various operations on them. The trainers assisted in debugging issues and optimizing code for better performance.

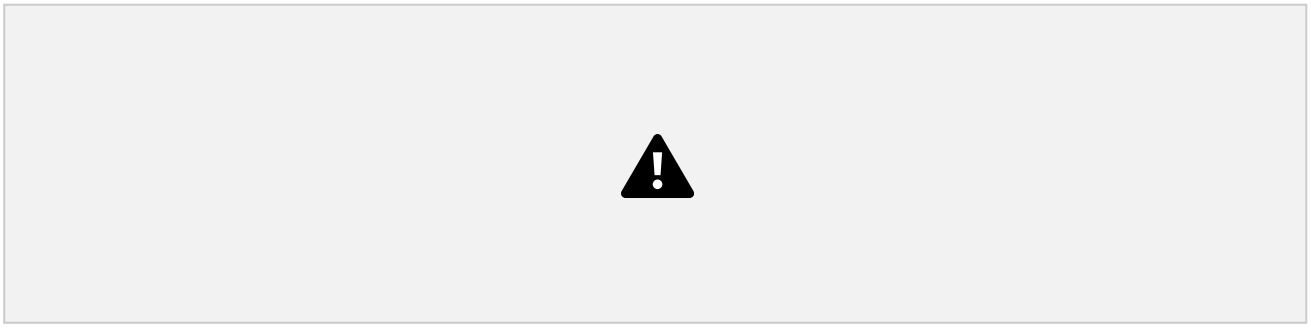
The day's activities reinforced students' understanding of circular linked list operations, setting the stage for learning more complex variations like doubly linked lists in the upcoming sessions.

On the nineteenth day, 6th March 2025, the session focused on interview preparation, covering how technical rounds are conducted and how HR asks questions during interviews. Resource persons Mr.Idris provided insights into common technical interview questions, coding challenges, and problem-solving strategies.

Students learned about best practices for technical interviews, including how to structure their answers, explain their thought processes, and handle problem-solving under pressure. The trainers also guided them on how to effectively showcase their skills and experience.

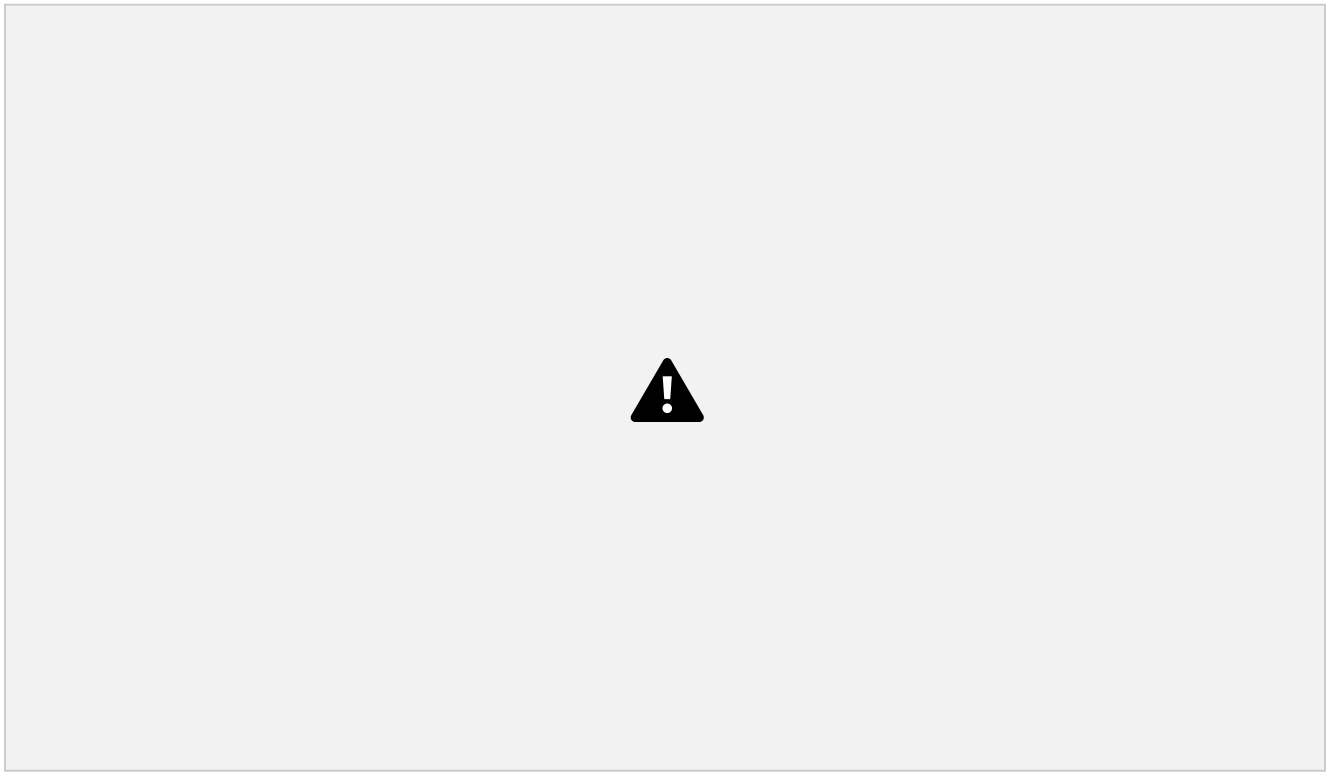
In the afternoon session, students participated in mock technical interviews, where they practiced answering technical questions and coding problems. Additionally, the trainers provided guidance on resume building, highlighting key points that should be included to make a strong impression on recruiters.

The day's activities aimed to prepare students for job interviews by improving their confidence, problem-solving abilities, and resume presentation, setting them up for success in their career paths.



On the 20th day, 7th March 2025, the session focused on Doubly Linked Lists and their operations. Resource persons Mr. Britto and Mr. Sai Nandu explained the structure of doubly linked lists, their advantages over singly and circular linked lists, and how they allow bidirectional traversal.

Students learned different techniques for implementing doubly linked lists and explored real-world applications where they are beneficial. The trainers demonstrated how to add, delete, and traverse nodes efficiently in a doubly linked list.



In the afternoon session, students practiced writing Java programs to implement doubly linked lists and performed various operations on them. The trainers assisted in debugging issues and optimizing code for better performance.

The day's activities reinforced students' understanding of doubly linked list operations, setting the stage for more advanced data structures and problem-solving techniques in the upcoming sessions.

Date:8th March2025

On the twenty-first day, 8th March 2025, the session marked the final day of the program. The day began with a three-hour online coding test designed to assess students' understanding of the concepts covered throughout the sessions.

Following the test, resource persons Mr.Britto and Mr.Sai Nandu introduced the basics of Hash Tables, Hash Maps, and Hash Sets. They explained how these data structures work, their advantages in terms of efficiency, and their real-world applications in Java programming.

In the afternoon session, students practiced implementing Hash Maps and Hash Sets in Java, performing operations like insertion, deletion, and searching. The trainers provided insights into handling collisions and optimizing hashing techniques.

The program concluded with a brief discussion on key takeaways from the training. Students gained valuable knowledge and hands-on experience with various data structures and algorithms, equipping them with essential problem-solving skills for technical interviews and real-world applications.

Outcome: