



A1Training
A1 Means Success



DATA STRUCTURE AND ALGORITHM

- **Course Feature**

- Learnbay Provides best Data structures And Algorithms training in Bangalore.
- Our Data Structures and Algorithms training program provides you deep understanding of Data structures and algorithms concepts from ground up.
- We provide best Data Structure Algorithm training in Bangalore with interview preparation for e-commerce companies and top product based MNC. So,If you are looking for best data structures and Algorithms training in Bangalore with interview preparation for e-commerce companies and top product based MNC like Amazon, Cisco, Microsoft, Nvidia, Netapp etc,this course is suitable for you.
- Our course content is designed by experts to match with the real world requirements for both beginner and advance level.100+ problems are implemented and discussed in the class with tons of assignments for practice.

Who Should Attend:

B.Tech/MCA Students looking for data structures coaching
Job seekers who are preparing for interview in Product
MNC/ecommerce companies

Anyone who has deep desire to learn Data Structures And Algorithms.

Duration Of Course - 10 Weeks Course - (3 Hours Each on Saturday and Sunday)

Class Duration:- 50 Hrs

Assignment: 20 hrs

Course Fee: RS. 24,000/-

Course Content

PART - A - Data Structures

What is Data Structure?
Basic Concept in Data Structures.

1: Stack

- Stack using Array
- Stack using list
- Stack using Queue

3: Linked list

- Linked list using singly
- Linked list using doubly
- Linked list using Circular

5: Hash Table

- Chaining
- Open Addressing – Basics
- Open Addressing – Linear Probing
- Open Addressing – Quadratic Probing

2: Queue

- Queue using Array
- Queue using Stacks
- Queue using list

4: Trees (BST, AVL, 2-4 , Red Black)

- Trees – BST
- Trees – AVL
- Trees – 2-4
- Trees – Red Black
- Trees

6: Graphs

- Graph and its representations
- Adjacency Matrix
- Adjacency List
- Directed Graph
- Undirected Graph

PART - B - Algorithms

1: Searching and Sorting.

- Binary Search, Selection Sort, Bubble Sort
- Insertion Sort, Merge Sort, Heap Sort
- Quick Sort , Radix Sort
- Complexity Theory
- Complexity Theory
- Big O Notation
- Typical Runtime Functions
- Comparing Run time Functions
- Divide and Conquer:
- Median of two sorted arrays
- Closest Pair of Points

2: Greedy Algorithms:

- Greedy Algorithm to find Minimum number of Coins
- K Centers Problem
- Dijkstra's Shortest Path Algorithm

3: Dynamic Programming

- Longest Increasing Subsequence
- Longest Common Subsequence
- Coin Change
- Min Cost Path
- Tiling Problem
- Weighted Job Scheduling

5: Trees

- Tree Terms
- Binary Tree Properties
- Traversals – Preorder
- Traversals – Postorder
- Traversals – Inorder

7. Recursion

- Fibonacci Numbers
- Tower Of Hanoi
- Fixing Fibonacci
- Selections
- Permutations

- **Interview Guidance/ Mock Interview Session**

How To Crack Coding interview - Tier 1

Companies like Amazon

, Microsoft, Flipkart And Google - Session by Expert

from Top Companies

Mock Interviews (One on one) With Expert

How to Approach System Design And Design Pattern Questions?

4: Backtracking Algorithms

- The Eight Queens Problem
- The Knights Tour
- Rat in a Maze

6: Balanced Trees

- What is Balanced Trees?
- B-Trees – B-Tree Basics
- B-Trees – Adding Items
- B-Trees – Removing Items

8: Graphs

- Network Algorithms
- Network Terminology
- Spanning Trees
- Shortest Paths
- Breadth First Traversal for a Graph
- Depth First Traversal for a Graph
- Application of Depth First Search
- Application of Breadth First Traversal
- Detect Cycle in a Directed Graph
- Detect Cycle in a an Undirected Graph
- Detect cycle in an undirected graph
- Longest Path in a Directed Acyclic Graph
- Topological Sorting
- Check whether a given graph is Bipartite or not
- Snake and Ladder Problem

OPTIONAL Add-On Modules

Part C - Design Patterns

Design Patterns (Recommended for Candidates With 1.5 yrs to 4 yrs of experience)

Design patterns are an essential part of any programming and coding interview, no matter whether you are going for Java interview or C++/.net interview. Candidates having IT experience of 1.5 Yrs to 4 Yrs and targeting for tier 1 Product based company need sound knowledge of design patterns apart from Data structures and algorithms skills to do well in their interviews.

Course Duration : 25 hours

Fee For Design Pattern Module: **Rs. 15000/- + Taxes**

Course Content

1: Introduction to Design Patterns

- Goals of OO Language, Revision of OOPs Concept :- Inheritance, Polymorphism, Interfaces, Different Member Field Attributes
- Reviewing Object-Oriented Principles
- Interpret Unified Modeling Language (UML) notation and create UML diagrams
- Identify selected design patterns
- Review the **Model-View-Controller (MVC) patterns**

2: Creational Design Patterns

- Introduction to creational design patterns : Abstract Factory, Builder, Factory, Prototype, Singleton - Applications And Case studies on each patterns With implementation in java/C++

3: Structural Design Patterns

- Introduction to Structural Design Patterns: Structural Design Patterns: Adapter, Bridge, Composite, Decorator, Facade, Flyweight, MVC, Front Controller, Module, Proxy Applications And Case studies on each patterns With implementation in Java/C++

4: Behavioral Design Pattern

- Introduction to creational design patterns : Abstract Factory, Builder, Factory, Prototype, Singleton - Applications And Case studies on each patterns With implementation

5: Introduction to Design Patterns

- Impact of the design on performance of multi-threaded applications ,Active Object design ,Monitor Object design ,Half-Sync/Half-Async ,Leader/Followers,Thread-Specific Storage

6: Project And Interview

- Project And Case Study on a Real Time Application Which involves design patterns covered in previous modules .Interview Guidance And mock interview on how to crack a design interview

Part D - System Design

System Design **(Recommended for Candidates With 4.5 + yrs of experience)**

Candidates Applying for senior role (SDE II and Above) needs to know the large distributed and scalable software system designs. System design questions have become a standard part of interview at **amazon ,microsoft ,google** and top tier e commerce companies like **flipkart** for a senior roles.

Course Duration : 25 hours

Fee For System Design Module: Rs. 15000/- + Taxes

Course Content

1: Introduction to System Design

- Introduction to System Design - Why System Design Interview? Approaching And narrowing down a problem, Identifying an Abstract Design , Optimising And addressing the bottlenecks.

2: System Design Basics I

- Load Balancing - Software And Hardware Load Balancers, Caching - Distributed And Global Cache, Content Distribution network(CDN), Sharding And Partitioning Methods, Common Problems of Sharding

3. System Design Basics II

- Database Indexing, Proxies - Proxy Server , Queues, SQL vs No SQL , CAP Theorem in distributed Computer Systems, Distributed Hash Table And Consistent Hashing, Web sockets, Ajax Polling

4: System Design Case Studies

- Designing an Instant messaging Services- Design Facebook Messenger - Case study to be covered in Classroom Design Twitter and Twitter Search - Consider the case for million + User Assignment : Design Whatsapp Messaging Services

5: System Design Case Studies II

- Design Book My Show Design Uber Backend

6: Interview Guidance

- Interview Guidance And mock interview on how to crack a design interview

• Interview Guidance/ Mock Interview Session

- How To Crack Coding interview - Tier 1 Companies like Amazon , Microsoft, Flipkart And Google - Session by Expert from Top Companies
- Mock Interviews (One on one) With Expert
- How to Approach System Design And Design Pattern Questions?

Course FAQ

6. Can I Attend a Demo Session before enrolling for the course?

Of course, You can attend a Free live Demo Session before enrolling for the Course.

7. Do I Need to carry my own laptop?

Yes, You need to carry your own laptop.

8. Are the session Online or Classroom?

We provide both live Online and classroom session. You can opt for online or classroom based on your convenience.

9. Will I Get Class Recording if I Enroll for Classroom Session?

Our live Classroom Sessions are recorded. After each session, Class recording link will be shared to you, irrespective of you are attending the class or not or you are attending classroom session or online session after enrollment of the course.

10. What if I miss few classes due to some emergency?

In this case you have to inform Learnbay at least 12 Hours before the class with specific reason over the mail. Video will be shared with you after the class, you may go through the video.

If you still feel that you need some class on those topics, then you may share the topic/s name with Learnbay. We will try to arrange few classes on the topics you have missed, from other trainer or from the same trainer depend on the availability of trainer and classes, available for those topics.

NOTE:- This support is applicable for very few classes you miss, like 3-4 Classes. If you miss the classes for more than 3-4 days then this support is not applicable in that case.

