CODING NINJAS

Jamboree™

C++ Foundation with
Data Structures and Algorithms-
Premium

Overview

Learn and practice the absolute basics of C++ and become an expert in the core fundamentals of programming. Data structures and algorithms skills are all about organizing the information and finding the most efficient approach to solve a problem. If you are looking to crack interviews with those prestigious FAANG companies and other MNCs, this course will help you lay the foundation and improve your problem-solving skills.

Highlights:

60+ hours of learning content and 500+ practice problems

6 months duration and 9 months validity

5 mock interviews in premium version

Suitable for students with or without admits

Pre-requisites:

Previous Coding experience is not required

Course Outcome:

You will learn the most commonly used data structures and algorithms that are necessary to solve problems by programming and increase your aptitude for interview preparation which target multiple job opportunities like software developer, software engineer, product/data roles, etc.

Key Highlights:

Mentor Support

Course Pause Feature

Certificate of Completion

Course Extension

Premium Key Highlights:

Curated interview problems

Industry mentor sessions, Resume & profile building workshops

DSA based product companies Mock Test Series

INTRODUCTION TO PROGRAMMING

TOPIC	SUB-TOPICS	DETAILS
BASICS OF PROGRAMMING	**Flowcharts**	Introduction to flow-charts, Decision making using flowcharts, Loops, Example problems
	Variables and Data types	First program, Variables and data types, Taking input, How data is stored in memory, Arithmetic Operators
	Conditional statements	Introduction to If else, Relational and logical operators, Nested conditionals
LOOPS AND FUNCTIONS	**While loops**	While loops, Flow of execution of statements in while loop, Example problems using while loop
	Patterns	Introduction to patterns, Basic Patterns, Square Patterns, Triangular Patterns, Character Patterns, Reverse Triangle, Inverted patterns, Isosceles triangles

TOPIC	SUB-TOPICS	DETAILS
LOOPS AND FUNCTIONS	For loops	For loops, Break and Continue, increment - decrement operators
	Functions	Introduction to functions, Working of function calling, Variables and its scope, Pass by value
ARRAYS	Introduction to arrays	Introduction to arrays, How arrays are stored in memory, Passing arrays to functions
	Searching and Sorting	Understanding Binary Search, Selection sort, Bubble sort, Insertion sort, Merging two sorted arrays
CHARACTER ARRAYS AND 2D ARRAYS	Character Arrays	Introduction to Character Arrays, storage and their functions
	2D Arrays	2D arrays, Storage of 2D arrays, Example problems using 2D Arrays

DATA STRUCTURES

TOPIC	SUB-TOPICS	DETAILS
PROBLEM SOLVING TECHNIQUES	Recursion	Introduction to recursion, Principle of mathematical induction, Fibonacci numbers, Recursion using arrays, Recursion using strings, Recursion using 2D arrays
	Time and space complexity	Order complexity analysis, Theoretical complexity analysis, Time complexity analysis of searching and recursive algrithms, Theoretical space complexity, Space complexity analysis of merge sort
OBJECT-ORIENTED PROGRAMMING	Basics of OOP	Introduction to oops, Creating objects, Getters, and setters, Constructors and related concepts, Inbuilt constructor and destructor, Example classes
	Advance concepts of OOP	Static members, Function overloading and related concepts, Abstraction, Encapsulation, Inheritance, Polymorphism, Virtual functions, Abstract classes, Exception handling

TOPIC	SUB-TOPICS	DETAILS
LINEAR DATA STRUCTURES	Linkedlists	Introduction to linked list, Inserting node in linked list, Deleting node from linked list, Midpoint of linked list, Merge two sorted linked lists, merge sort of a linked list, Reversing a linked list
	Stacks and Queues	Introduction to stacks, Stack using arrays, Dynamic Stack class, Stack using linked list, Inbuilt stack, Queue using arrays, Dynamic queue class, Queue
TREES	Generic Trees	Introduction to Trees, Making a tree node class, Taking a tree as input and printing, Tree traversals, Destructor for tree node class
	Binary Trees	Introduction to Binary Trees, Taking a binary tree as input and printing, Binary Tree traversals, Diameter of binary tree

TOPIC	SUB-TOPICS	DETAILS
TREES	Binary Search Trees	Introduction to Binary Search Trees, Searching a node in BST, BST class, Inserting and Deleting nodes in BST, Types of balanced BSTs
ADVANCED DATA STRUCTURES	Priority Queues	Introduction to Priority Queues, Ways to implement priority queues, Introduction to heaps, Introduction to Complete Binary Trees and its implementation, Insert and Delete operations in heaps, Implementing priority queues, Heap sort, Inbuilt Priority Queue
	Hashmaps	Introduction to Hash-maps, Inbuilt Hashmap, Hash functions, Collision handling, Insert and Delete operation implementation in hashmap, Load factor, Rehashing
	Tries and Huffman Coding	Introduction to Tries, Making a Trie Node class, Insert, Search and Remove operation implementation in Tries, Types of Tries, Huffman Coding

TOPIC	SUB-TOPICS	DETAILS
ADVANCED DATA STRUCTURES	Graphs	Introduction to Graphs, Graph Terminology, Graph implementation, Graph Traversals (DFS and BFS), Weighted and Directed Graphs,Minimum Spanning Trees, Cycle Detection in Graphs, Kruskal's algorithm, Prim's Algorithm, Dijkstra's algorithm
DYNAMIC PROGRAMMING	Introduction to Dynamic Programming	Introduction to Memoization, Introduction to Dynamic Programming, Fibonacci numbers using recursion, memoization and dynamic programming
	Applications of Dynamic Programming	Longest Common Subsequence (LCS) using recursion, memoization and dynamic programming, Edit distance using recursion, memoization and dynamic programming, Knapsack problem using recursion, memoization and dynamic programming

APTITUDE PREPARATION:

TOPIC	SUB-TOPICS	DETAILS
NUMBERS	Introduction to Number System	Number System, Remainder theorem, Unit Digit
	Progressions	Arithmetic progression, Geometric progression
	HCF and LCM	Finding factors of a number, Shortcuts for finding prime number, Concept of HCF, Problem Solving on HCF, Concept of LCM, Problem Solving on LCM
AVERAGES AND MIXTURES	Averages	Introduction to Averages, Assumed average approach, Standard Situation in Averages, Concept of Weighted Averages, Standard Situations involving weighted average
	Alligations	Introduction to alligations, Standard problems involving using alligations

TOPIC	SUB-TOPICS	DETAILS
ARITHMETIC AND WORD PROBLEMS	**Percentages**	Concept of percentages, Concept of percentage change, Percentage Change Graphic, PCG applied to Product change, PCG Applied to Product Constancy, Product Constancy Table, The fractional view to the product constancy table, PCG applied to successive percentage change
	Ratio, Proportion and Variation	Concept of Ratios, Multiplier logic, Concept of proportion Variation and its types
	Profit and loss	Basic concept of Profit and loss, Concept of Simple Interest, Concept of Compound Interest
	Time and work	Introduction to Time and Work, Time and work (Man Days), Men, Women and Children

TOPIC	SUB-TOPICS	DETAILS
COUNTING	Probability	Basics of Probability, Problems on Coins, Problems Based on Dice, Problems Based on Cards, Problems Based on Balls from the Box, Word Based problems on Probability
	Permutation and Combination	Introduction to Permutation and Combination, The selection Formula, Distribution of Identical Objects, Formula for Arrangements, Circular arrangement
TIME, SPEED AND DISTANCE	Introduction to Time, Speed and Distance	Introduction to Time, Speed, Distance The proportionalities in equations. Solving problems on TSD
	Relative Speed	The concept of Relative Speed. Questions based on Relative Speed
	Application of TSD	Concept of Circular Motion, Train problems Boats and Stream problems, Races and Games

TOPIC	SUB-TOPICS	DETAILS
REASONING	**Recognising Patterns**	Recognising alphabetical patterns, Recognising numerical patterns, Coding Decoding Question Patterns
	Syllogisms	Introduction to Syllogisms, Problems on Syllogisms
	Blood relation and calendars	Solving problems on Blood Relations, Concept of Calendar, Problems on Calendar
ENGLISH	**Reading Comprehension**	Reading effectively reading comprehension, How to find main idea, Solving reading comprehension
	Sentence completion/Fill ups	Theory of Fill Ups/ sentence completion, Questions on sentence completion
	Vocab, Antonym and Synonyms	Introduction to English, Vocab-Root Words, Synonyms and Antonyms

TOPIC	SUB-TOPICS	DETAILS
DATA INTERPRETATION	Basic Concept of Data interpretation	Introduction to Data interpretation, Problems on Data interpretation
	Charts	Reading Pie charts, Reading Bar Charts, Reading tables and X-Y Charts, Problems on Charts
MISCELLANEOUS TOPICS	Set theory	Introduction to Set Theory, Problems on Set theory
	Log	Introduction to logs, Problems on logs
	Mensuration	Cubes and Cuboids, Spheres and Cylinders, Cones, Prisms and Pyramids

About us

Founded in 2016 by IIT, Stanford and Facebook alumni Coding Ninjas is one of the largest online coding EdTech companies in India. We teach 20,000+ students annually via our online platform.

Our founders have experience of working with Amazon, Facebook, Cars24, and other top startups in India.

As pioneers in EdTech, we are on the path to become India's most loved coding education platform.

IIT Delhi, Stanford, Facebook alumni

Raised Series A funding from InfoEdge Technologies

50,000+ learners across the country

India's most loved coding platform

Founded in 2016

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