Data Structures & Algorithms Training

(Basics – 30 Hours & Advanced - 30 Hours)

A training pack for students & beginners

Dear Sir/Madam

Sub: To organize Data Structures and Algorithms Training in your college.

This is to bring to your kind notice that **POSITIVE QUADRANT TECHNOLOGIES LLP** is an Indian entity exploring itself in various sectors like Software Development , Augmented Reality , Virtual Reality , IoT , Simulation ,Games Development ,Mobile Applications,3D Modelling Development , Practical Educational Training, Professional Training, Corporate Training, Web & IT Services.

Data Structures and Algorithms Training conceptualized by **some top industry professionals** in association with **POSITIVE QUADRANT TECHNOLOGIES LLP**. It is going to be India's first & biggest training series based on this market flag bearer of all next generation technologies.

This workshop will also provide a platform where young engineers can mould their imagination into reality and feel the excitement first-hand. With this end in view, we extend our support and technical expertise to the young engineers of your College in the form of this workshop. We seek your cooperation and look forward towards a successful execution of this workshop in your college.

We are hoping that you will find this training really interesting for the students. If you have any queries, please get back to us anytime.

Basics 30 Hours

Introduction: (Basics)

- –Concept Data Structure
- –Example
- –Need of Data structure
- –Advantages of using DS

Algorithm & Pseudocode: (Basics)

- –Algorithm Definition
- –Characteristics of algorithm
- –Elements of algorithm
- –Pseudocode example
- –Difference of Algorithm & Pseudocode

Function: (Basics)

- –What is function
- –Types of function
- –How function works
- –Function recursion and how it works.

Array: (Basics)

- –Concept of Array
- –Types of array
- –Basic Programs
- –Array with Functions
- –Single & 2-dimensional array in function
- argument.

Pointer: (Basics)

- –Pointer Basics
- –Pointer with functions
- –Call by reference
- –Array of pointers & pointer to array & Programs

Structure: (Basics)

- –Understanding about Structure
- –Pointer structure variable
- –Structure as function argument
- –using call by member value
- –hole structure and call by
- –passing reference of structure.

Stack: (Basics)

- –Operations on Stack
- –Array & Linked Representation
- –Programs on stack
- –Push & Pop operations
- –Traversing.

Applications of Stack : (Basics)

- –Arithmetic Expression Evaluation
- –Notations, Infix
- –Postfix, Prefix
- –Conversion infix to post fix
- –Conversion postfix to infix
- –Evaluation of Postfix and Pre fix using
- stack.

Queue: (Basics)

- –Operations on Queue
- –Array & Linked Representation
- –Programs on stack
- –Insert & Delete operations
- –Circular queue
- –Rrepresentation
- –Deque
- –Priority Queue
- –Application of queue.

Basics 60 Hours

LinkedList: (Advanced)

- –Concept of linked list
- –Difference of linklist & array
- –Single linked list
- –Representation
- –Operations
- –Traversing
- –Insertion(first node, last node, at a
- position, after a node value)
- –Deletion(first node, last node, at a position,
- after a node value)
- –Double linked list
- –Representation
- –Operations, traversing
- –Insertion (first node, last node, at a
- position, after a node value)
- –Deletion (first node, last node, at a
- position, after a node value)
- –Circular link list & header link list example

Tree: (Advanced)

- –Tree terminology
- –Binary tree
- –Complete Binary Tree
- –Binary search tree
- –Tree Traversals
- –Creation of Binary Tree from traversal
- methods
- –Expression Tree & expression

Manipulation:(Advanced)

- –Binary Search Tree
- –Insertion & deletion in BST(Program)
- –AVL Tree, M-way Search Tree
- –B+ tree, Insertion & deletion.

Graph: (Advanced)

- –Graph terminology
- –Representation of graphs
- –Path matrix
- –Graph Traversal
- –BFS (breadth first search)
- –DFS (depth first search)
- –Minimum spanning Tree
- –Kruskal's Algorithm & Prim's Algorithm
- –Warshall's algorithm (shortest path
- algorithm).

Hashing & Searching: (Advanced)

- –Linear and binary search methods
- –Hash functions
- –Hashing techniques & Chaining.

Sorting: (Advanced)

- –Bubble sort
- –Selection sort
- –Insertion sort
- –Quick sort
- –Merge sort
- –Heap sort
- –Radix sort