

C C++ JAVA DS TRAINING INSTITUTES IN
KPHB, Kukatpally, HYDERABAD

Algorithm Class

KPHB, Hyderabad.

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ALGORITHM CLASSS website: <http://sites.google.com/site/algorithmclass>

C PROGRAMMING

C Data types

- Data types
- Type Conversions
- Declaration and definition

C Operators

- automatic
- Arithmetic Operators
- Relational and Logical Operators
- Bitwise Operators
- Precedence and Order of Evaluation

C Control Flow

- If
- Switch
- loops: for, while and do-while
- break and continue

C Scope and storage

- Register
- static
- extern

C Preprocessor

- macros
- File inclusion
- macro substitution
- conditional inclusion
- if.....

C Functions

- Introduction to Functions
- Defining & Calling Functions
- Pass by Value
- Return by value & return by address
- Recursive Functions

C Scope and storage

- automatic
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C Preprocessor

- macros
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C Functions

- Introduction to Functions
- Defining & Calling Functions
- Pass by Value, pass by Reference
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C Pointers

- Memory layout
- dynamic memory allocation
- Malloc , calloc ,realloc and free
- Pointers to variable
- pointer arithmetic
- Pointers to pointers
- pointer and arrays
- pointer and char strings
- pointer arrays
- pointers and multi dimensional arrays
- command line arguments
- pointers to functions
- Complicated declarations

C Arrays

- Introduction to Arrays
- Need for Arrays
- Arrays with pointers
- Arrays with functions
- Types of Arrays

C Strings

- Char pointers
- Char array (String)
- Declaring & Initializing String Variables
- Strings with pointers
- Strings with functions
- String Functions
- Creation of our own string.h
- Array of Strings

C Structures, Unions, Enum and typedef

- Enum and typedef
- Introduction to Structures
- Defining Structures
- Struct with pointers , arrays, strings and functions
- Array ,strings as Structures Members
- Containership
- Union, Different between Structure & Union

DS Data Structures

- Introduction to
- Sorting
- Bubble Sort
- Insertion Sort
- Selection sort
- Merge Sort
- Quick Sort
- Heap Sort

- Recursion
- Linked Lists
- Single linked lists
- Double linked lists
- Circular linked lists
- Stacks
- Queues
- Trees
- Graphs
- Tries
- Suffix trees
- Suffix arrays
- AVL trees
- B-trees

C++ PROGRAMMING CPP

C++ INTRODUCTION

Comments
Typecasting
Void Pointers
The :: operator
The Const Qualifier
Reference variables

C++ FUNCTIONS

Function Prototypes
Function Overloading
Default Arguments in Functions
Call by value, address & reference
Return by value, by address & By reference
Inline Functions

CPP CLASS

Member function
Function Definition Outside The Class
Classes and Constructors
Destructors
Copy Constructor
The this Pointer
New and delete Operators
Using new and delete
Malloc () / free () versus new/delete
Classes, Objects and Memory
Structures vs. Classes
Static Class Data
Static Member Functions
Data Conversion
Friend functions & friend Classes
Data Conversion between Objects of Different Classes

C++ OPERATOR OVERLOADING

Introduction
Overloading assignment operator
Overloading ++, --, +, -, *, /, <, > &
Logical operators
Overloading operators between different
objects
Overloading << and >> (stream
operators)

CPP INHERITANCE

Constructors in Inheritance
Private Inheritance
Protected Inheritance
Functions That Are Not inherited
Virtual Function
Pure virtual functions
Virtual Functions in Derived Classes
Virtual Functions and Constructors
Destructors and virtual Destructors
Virtual Base Classes
Abstract class
Abstract base class

C++ ADVANCED FEATURES

Classes Within Classes
Friend Functions
Friend classes
Overloading << and >>.

C++ IO

Manipulators
File I/O with Streams
Opening and closing files
Creating database with file Operation
Binary I/O
Elementary Database Management
Interacting with
Text files (ex: .txt, .c, .cpp)
Non-text files (ex: .dat, .mpg, .avi, .mp3)
Creating database with file operation

Data Structures DS

ALGORITHM ANALYSIS

STACKS DATA STRUCTURE DS

a) Array and linked list implementation of a stack

create stack()
isempty()
push()
pop()

b) infix to post fix conversion

c) evaluate postfix expression

RECURSION DS

QUEUES DATA STRUCTURE DS

a) Array and linked list implementation of a queue

create queue()
isempty()
insert()
remove()

b) circular queue

c) double ended queue

LINKED LISTS DS

a) linked list

insertFront()
insertAfter()
insertEnd()
DelFirst()
DelEnd()
DeleAfter()

a) Circular linked list

insert()
remove()
stack as CLL
queue as CLL

c) Doubly linked list

setLeft()
setRight()
remove()
removeLeft()
RemoveRight()

SORTING DS

Bubble sort
Insertion sort
Quick sort
Merge sort
Heap sort
Priority queue

SEARCHING DS

Linear Search
Binary search
Hashing

TREES DATA STRUCTURE DS

a) Tree terminology

b) General tree

c) expression tree

d) Binary Tree

e) Binary Search Trees

createtree()

setleft()

setRight()

createTree()

disposeTree()

FindKey)_

findMin()

findMax()

f) Preorder, inorder and post order traversals

PreTraversal()

postTraversal()

inorderTrav()

g) find inorder successor, predecessor

h) Construct original tree from given pre order and in order traversals.

Construct original tree from given post order and in order traversals.

i) Tree delete operation

Advanced Data Structures DS

TRIE DATA STRUCTURE DS

node Structure
getNode()
insert()
search()

SUFFIX TREES DATA STRUCTURE DS

node Structure
getNode()
insert()
search()

SUFFIX ARRAY DATA STRUCTURE DS

build suffix array
search()

TERNARY SEARCH TREE DS

Introduction
insert()
search()

AVL TREE DATA STRUCTURE DS

TOURNAMENT TREE DS

GRAPHS DATA STRUCTURES DS

Adjacency matrix
Adjacency list
BFS
DFS
Detect Cycle in a graph
Topological sorting
check the given graph is tree or not
Find the number of islands

DYNAMIC PROGRAMMING DS

Introduction to dynamic programming
memorization (top down)
tabulation (Bottom up)
optimal sub structure

Algorithm Class

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