JobDuniya

Technical Papers Data Structure: Data Structure Part I

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What is data structure?

A data structure is a way of organizing data that considers not only the items stored, but also their relationship to each other. Advance knowledge about the relationship between data items allows designing of efficient algorithms for the manipulation of data.

List out the areas in which data structures are applied extensively?

- Compiler Design

- Operating System

- Database Management System

- Statistical analysis package

- Numerical Analysis

- Graphics

- Artificial Intelligence

- Simulation

What are the major data structures used in the following areas: RDBMS, Network data model & Hierarchical data model.

- RDBMS Array (i.e.. , Array of structures)

- Network data model Graph

- Hierarchical data model Trees

If you are using C language to implement the heterogeneous linked list, what pointer type will you use?

The heterogeneous linked list contains different data types in its nodes and we need a link, pointer to connect them. It is not possible to use ordinary pointers for this. So we go for void pointer. Void pointer is capable of storing pointer to any type as it is a generic pointer type.

Minimum number of queues needed to implement the priority queue?

Two. One queue is used for actual storing of data and another for storing priorities.

What is the data structures used to perform recursion?

Stack. Because of its LIFO (Last In First Out) property it remembers its calleR'so knows whom to return when the function has to return. Recursion makes use of system stack for storing the return addresses of the function calls.

Every recursive function has its equivalent iterative (non-recursive) function. Even when such equivalent iterative procedures are written, explicit stack is to be used.

What are the notations used in Evaluation of Arithmetic Expressions using prefix and postfix forms?

Polish and Reverse Polish notations.

- Convert the expression ((A + B) ∗ C (D E) ^ (F + G)) to equivalent Prefix and Postfix notations.

- Prefix Notation: ^ -∗ + ABC-DE + FG

- Postfix Notation: AB + C ∗ DE--FG + ^

Sorting is not possible by using which of the following methods?

- Insertion

- Selection

- Exchange

- Deletion

Using insertion we can perform insertion sort, using selection we can perform selection sort, using exchange we can perform the bubble sort (and other similar sorting methods) . But no sorting method can be done just using deletion.

A binary tree with 20 nodes has null branches? 21

Let us take a tree with 5 nodes (n = 5)

It will have only 6 (i.e.. , 5 + 1) null branches. In general.

A binary tree with n nodes has exactly n + 1 null nodes.

What are the methods available in storing sequential files?

- Straight merging

- Natural merging

- Polyphase sort

- Distribution of Initial runs.

How many different trees are possible with 10 nodes?

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For example, consider a tree with 3 nodes (n = 3) , it will have the maximum combination of 5 different (i.e.. , 23 − 3 = 5) trees.

In general: If there are n nodes, there exist 2n-n different trees.

List out few of the Application of tree data-structure?

The manipulation of Arithmetic expression.

Symbol Table construction.

Syntax analysis.

List out few of the applications that make use of Multilinked Structures?

Sparse matrix.

Index generation.

In tree construction which is the suitable efficient data structure?

- Array

- Linked list (correct answer)

- Stack

- Queue

- none

What is the type of the algorithm used in solving the 8 Queens problem?

Backtracking

In an AVL tree, at what condition the balancing is to be done?

If the pivotal value ' (or the Height factor') is greater than 1 or less than 1.

What is the bucket size, when the overlapping and collision occur at same time?

One. If there is only one entry possible in the bucket, when the collision occurs, there is no way to accommodate the colliding value. This results in the overlapping of values.

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