Syllabus Of Data Structure

Detailed Contents

Unit -I
Introduction to Data Structures:
Algorithms and Flowcharts, Basics Analysis on Algorithm, Complexity of Algorithm, Introduction and Definition of Data Structure, Classification of Data, Arrays, Various types of Data Structure, Static and Dynamic Memory Allocation, Function, Recursion.

Arrays, Pointers and Strings:
Introduction to Arrays, Definition, One Dimensional Array and Multidimensional Arrays, Pointer, Pointer to Structure, various Programs for Array and Pointer. Strings. Introduction to Strings, Definition, Library Functions of Strings.

Unit-II
Stacks and Queue :-
Introduction to Stack, Definition, Stack Implementation, Operations of Stack, Applications of Stack and Multiple Stacks. Implementation of Multiple Stack Queues, Introduction to Queue, Definition, Queue Implementation, Operations of Queue, Circular Queue, De-queue and Priority Queue.

Unit-III
Linked Lists and Trees
Introduction, Representation and Operations of Linked Lists, Singly Linked List, Doubly Linked List, Circular Linked List, And Circular Doubly Linked List.

Trees
Introduction to Tree, Tree Terminology Binary Tree, Binary Search Tree, Strictly Binary Tree, Complete Binary Tree, Tree Traversal, Threaded Binary Tree, AVL Tree B Tree, B+ Tree.

Unit -IV
Graphs, Searching, Sorting and Hashing Graphs:
Introduction, Representation to Graphs, Graph Traversals Shortest Path Algorithms.
Searching and Sorting:
Searching, Types of Searching, Sorting, Types of sorting like quick sort, bubble sort, merge sort, selection sort.
Hashing:
Hash Function, Types of Hash Functions, Collision, Collision Resolution Technique (CRT), Perfect Hashing

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UNIT I

❖ Introduction to Data Structures

Basicconceptofdata

Data

Data is a raw and unorganized fact that required to be processed to make it meaningful. Data can be simple at the same time unorganized unless it is organized. Generally, data comprises facts, observations, perceptions numbers, characters, symbols, image, etc. Data is always interpreted, by a human or machine, to derive meaning. So, data is meaningless. Data contains numbers, statements, and characters in a raw form.

Examples of data are weights, prices, costs, numbers of items sold, employee names, product names, addresses, tax codes, registration marks etc
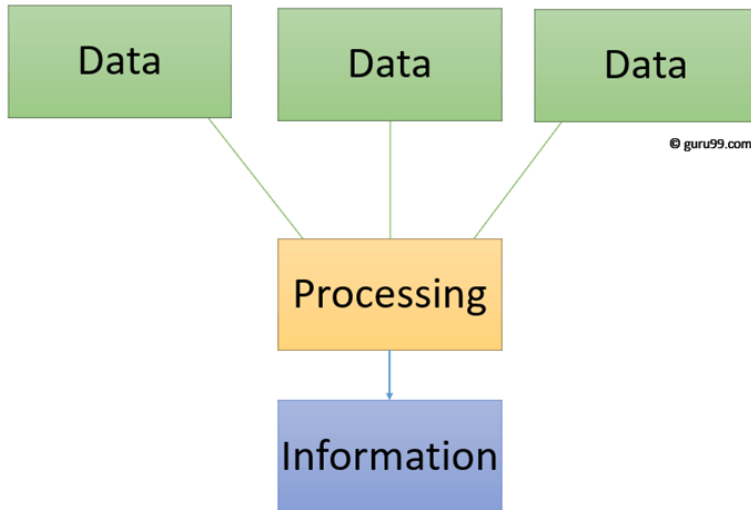
Information

Information is a set of data which is processed in a meaningful way according to the given requirement. Information is processed, structured, or presented in a given context to make it meaningful and useful.

It is processed data which includes data that possess context, relevance, and purpose. It also involves manipulation of raw data.

Information assigns meaning and improves the reliability of the data. It helps to ensure undesirability and reduces uncertainty. So, when the data is transformed into information, it never has any useless details.

Example :- Information is data that has been converted into a more useful or intelligible form.

Difference between Data and Information

Data	Information
Data is in the form of numbers, letters, or a set of characters.	Ideas and inferences
It can be structured, tabular data, graph, data tree, etc.	Language, ideas, and thoughts based on the given data.
Data does not have any specific purpose.	It carries meaning that has been assigned by interpreting data.
Data that is collected	Information that is processed.
Data is a single unit and is raw. It alone doesn't have any meaning.	Information is the product and group of data which jointly carry a logical meaning.
It never depends on Information	It depended on Data.
Measured in bits and bytes.	Measured in meaningful units like time, quantity, etc.
It can't be used for decision making	It is widely used for decision making.
It is low-level knowledge.	It is the second level of knowledge.
Data depends upon the sources for collecting data.	Information depends upon data.

❖ **Problem Analysis**