Introduction to Data Structure

bitCode technologies

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Introduction

- Data is a basic unit that any computing system centers around.

- What is data structure?

  Data Structure is an arrangement of data in computer's memory (or sometimes on a disk) so that we can retrieve it & manipulate it correctly and efficiently.

Definitions

- **Data type**

  - Information itself has no meaning because it is just sequence of bytes.

  - It is interpretation of bit pattern that gives it's meaning.

  - For example 00100110 can be interpreted as number 38(binary), number 26(binary coded decimal) or the character '&'.

  - A method of interpreting bit pattern is called as a data type.

  - So data type is a kind of data that variable may hold in a programming language. For example in 'C++' int, float, char & double

Definitions

- **Data object** is a term that refers to set of elements. Such set may be finite or infinite.

- **Data structure** is a set of domains D, a set of functions F and a set of axioms A.

- A triple (D, F,A) denotes the data structure d.

Abstract Data Type

- ADT is a conceptual representation.
- ADT is a mathematical model together with various operations defined in that model.
- ADT is a way of looking at Data Structure focusing on what it does and not how it does.
- Data Structure is implementation of ADT.

Examples of Data Structure

- Arrays
- Stacks
- Queues
- Linked Lists
- Trees
- Graphs