Data Structure and Abstract Data Types

Monday, April 29, 2024   11:22 AM

Data Structure is a way of Organizing the data in a way that it can be used effectively.

What is a Data Structure?

A **data structure** (DS) is a way of organizing data so that it can be used effectively.

Data structures are powerful ingredient that
- helps create fast and powerful algorithms.
- help to manage and organize the data.

Why Data Structures?

They are essential ingredients in creating fast and powerful algorithms.

They help to manage and organize data.

They make code cleaner and easier to understand.

ADT Abstract data structure is only the abstraction of those data structures which provides only the interface to which a data structure must adhere to. One example is suppose we have to go from A to B, that means we have to from some mode of transportation, Walk, Bike, Run or Bus.

Abstract Data Type

An **abstract data type** (ADT) is an abstraction of a data structure which provides only the interface to which a data structure must adhere to.

The interface does not give any specific details about how something should be implemented or in what programming language.

Examples

Abstraction (ADT)	Implementation (DS)
List	Dynamic Array Linked List
Queue	Linked List based Queue Array based Queue Stack based Queue
Map	Tree Map Hash Map / Hash Table
Vehicle	Golf Cart Bicycle Smart Car

References

Abstract data types