

Abstract data types & Arrays

ADTs are the way of classifying data structures by providing a minimal expected interface and set of methods.

ADT \rightarrow Minimal required functionality
 \rightarrow operations

ARRAY - ADT

An array ADT holds the collection of given elements accessible by an index.

\downarrow
Can be int, float, custom

Minimal functionality \div $\text{get}(i) \rightarrow$ get element i
 $\text{set}(i, \text{num}) \rightarrow$ set element i to num.
representation

Operations \div $\text{Max}()$
 $\text{Min}()$
 $\text{Search}(\text{num})$
 $\text{Insert}(i, \text{num})$
 $\text{Append}(x)$

Static and Dynamic arrays

Static arrays \rightarrow Size cannot be changed

Dynamic arrays \rightarrow Size can be changed

Quick Quiz : Code the operations mentioned above in C language by creating Array ADT using Structures.

Memory representation of Arrays

Index \rightarrow	0	1	2	3
	7	9	13	2
address \rightarrow	10	14	18	22

26 \Rightarrow Array of Size 4

Elements in an array are stored in contiguous memory locations

Elements in an array can be accessed using the base address in constant time $\rightarrow O(1)$