Abstract data types & Arrays

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

ADT < Minimal required functionality
→ Operations

ARRAY — ADT

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

Can be int float, custom

Minimal functionality — get (i) → get element i
Set (i, num) → Set element i to num.
representation

Operations — Max()
Min()
Search (num)
Insert (i, num)
Append (x)

Static and Dynamic arrays

Static arrays → Size cannot be changed

Dynamic arrays → 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 → 0 1 2 3

7	9	13	2

⟹ Array of Size 4

address → 10   14   18   22   26

Elements in an array are stored in contiguous memory locations

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