_	Mela t I t I I I O Account
	Abstract data types & Arrays
- har	Anto au Maria de Charles
-	ADTs are the way of classifying data Structures by providing a minimal expected interface and Set of methods
-	by providing a minimal expected interface and
$\dashv$	Set of methodson to nathanian we not
$\dashv$	ADT Minimal required functionality
$\dashv$	to the company of the state of
1	operations
$\dashv$	ARRAYO - A DOTAL WAS WALLE ALL IN WILLIAM ALL IN WI
$\neg$	An onerous ADT holds the Collection of given elements
$\neg$	An array ADT holds the collection of given elements accessible by an index.
	Misimal Cureling the int
	Minimal functionality - get (i) -> get element i floot, austom
	Set (i. num) -> Get element i to num
	Set (i, num) → Set element i to num. representation
	Operations - Max()
	Min ()
	Search (num)
	Insert (i, num)
	Append (x)
4	
4	Static and Dynamic arrays
4	
+	Static arrays -> Size lannot be changed
+	
+	Dynamic arrays -> Size lan be changed
+	
+	
$\perp$	

. 1	
	Quick Aug: Code the Operations mentioned also in Clanguage by creating Array ADT using Structures.
	in Clampunge by creating Array ADT using
iland	Skuchukan
TO ALL D	STUNCTURES Retained to president De presidented Ma
Derit	Memory representation of Arrays
	Index - 0 1 2 3
RUNICUE	7 9 13 2 > Array of Size +
	address + 10 14 18 22 26
	Elements in an array are stored in contiguous
CHOLL	elements in an array are stored in contiguous
1	accossible and index.
30 Jvg.	Elements in an away can be accessed using the base address in constant time -> O(1)
2	base address in constant time -> O(1)
YWY.	t i trement i to
	vebreeminhion —
	Doerations - Mari
	( ) NiM
	(wing ynos
	Insent (c) num.)
	Eppard (x)
	Static and Dynamic arrange
	Storow mouth pur syste
	Land to the state of the state
	Statis arrows -> Six amount no thousand
	Static arrays - Sizy lawnot be thought
	Lean All Indiana I and I
	of the same of the

	Operations on an Array
1	trade of the techniques and and trade of the techniques
	Following operations are supported by an array.
_	
311	Traversal There can be many other
_	Insertion $\Rightarrow$ operations one can perform  Deletion on arrays as well:
_	Deletion on arrays as well:
-	Search eg: Sorting asc., Sorting desc.
1.	a man of halful.
	Traversal
	Visiting every element of an array once -> Traversal
- 1	TOTAL OF TEST BY BY BUILDING & MINE OF MARKET
_	Why traversal ? -> for use cases like:
_	→ Storing all elements → using scant
	→ Printing all elements → using printf
03	HA CHERT AT COUNTY COSTION CAN BE LIGHT
_	An important note about arrays
	An important note about arrays  If we create an array of length 100 using a [100]  In C language, we need not use all the elements.
	in' C language, we need not use all the elements.
7	It is possible for a program to use just 60
_	elements out of these 100.
A n	But we cannot go beyond
_	100 elements.
-	A seed and seed the seed of th
_	An array can easily be traversed using a for loop
_	inco Collanguage was the all wind all no in
+	of protection with intex sate to been sate that of
+	0 1 2 000 98 99 trained down
-	7911
4	4 byles

	Insertion was the more more ensured
	An element can be inserted in an array at
	Insertion An element can be inserted in an array at a specified position.
	In order for this operation to be successful; the array should have enough sapacity
1	array should have enough sapacity
	CONTRACTOR OF THE PROPERTY OF
	1 9 11 13 => Elements need to be
	5 Shifted to maintain
	relative order.
Vic	resort - sincrophila no to thomas without
	When no position is specified its best to insert the element at the end
	the element ato the ended of shareway until
Line	From the standing of the standing to
41.00	Deletion Amused in Mitain 4
	An element at specified position can be deleted creating
	An element at specified position can be deleted creating a void which needs to be fixed by shifting all the elements to the left as follows:
[sell	all the elements to the left as follows:
1 1000	mile with the total to 2 then the openioned I as
UÒ	1 1 9 11 138 Delete 11 at ind 2
	elements out of these to
1-2-4	1 9 138 Shift the elements
	Marines (10)
	1 9 13 8 Deletion done
else:	An array can't be femeral warm is in
	We can also bring the last element of the array
	to fill the void if the relative ordering is
	not important
100	

- 0	Dearching can be done by traversing the array until the element to be searched is found
	Searching can be done by terrering the array until
	the element to be searched is found
	الم
	1 2 3
	7 9 11 12 for borked array time taken to search is
	7 9 11 12 taken to Scarch 15  Token to Scarch 15  much less than unsorked
	array!
	word : 3
9	ortina
0	orting means arranging an varray in order (asc or desc)
	many makes proceedings with value ( use of also )
	Ve will see various sorting techniques later in the course.
T.	the see soring herriques with in the course.
	12 7 18 1 8 => 1 7 8 12 18
	unsorled array Sorled array
	SOFRA UNIAL