- Aim: Weite a menu driven Program to Sort an Average Using Insertion Sort.
- Objective: To implement sorting algorithm having time complexity of $O(n^2)$ in whost case.

Aim:	Write a menu driven Program to sort an Away Using Insertion Sort.
Objective:	To implement sorting algorithm having time complexity of O(n2) in wrost case.
Theory:	Insertion sort is simple & Intutive sorting Algorithm that builds up the sorted away one element at a time. It works by iteratively taking an element from the unsorted part of the array & inserting it into it's correct position within the sorted portion. The algorithm maintains two subarreads within the original way ise the sorted sub-array that is initially empty and the unsorted sub-array, instaining the remaining elements.
	The provess begins by considering the 1st element of the array as the sorted portion. The Algo then iterates through the unsorted portion taking one element at a time & inserting it into it's proper position within the sorted subcurray. Insertion sort sort is an in-place sorting algorithm, it it requires a constant amount at additional memory for temp var CENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR-441 108

Code:	#include < stdio-h>
	vaid Martion Sort (int over [] int n) {
	int i, key, j;
	for (i=1; i <n; i++){<="" td=""></n;>
-	kpy = arr [i]; j = i - 1;
	Juhile (i 7=0 && Orr [i77ken) }
	while (j)=0 && are [j] 7 key) { are [j+1] = are [j];
*	AND THE RESERVE OF THE PARTY OF
	$\int_{J} j = j - 1;$
	0 [
	arc [j+1] = key;
(F 3 * F	
7.	Void print Arcray (int arr [], int size){
	for (inti=0: irsize: itt) {
	for (int i=0; i < size; i++)? printf (":1.d", arr [i]);
-	}
	pintf (" \n");
	phote (n)
7	

-	int main () {
	int n;
	printf ("Enter the number of elements:"); Scanf ("1.d", &n);
	int arr [n]:
. 4	prontf ("Enter the elements:");
4	for (inti=0; i <n; i++)<="" td=""></n;>
Ŋ.	point (" Element : 1 - d" i + 1):
	pontf (" Element 11-d", i+ 1); Scanf (" 1/d", am [i]);
	printAvray (Over, n):
	printAvery (au, n);
	insertionSort (amn);
	printf ("Sorted Away is:");
	printf ("Sorted Arreay is:"); print Array (arr n);
	return 0;
office Pip u	Secretary of the figure of the

Output:	Enter the number of elements: 5
13	Enter the elements:
	Flement 1:50
	Flement 2: 40
18.1	Element 2:30
	Element 4:20
	Element 5: 10
v <u>F</u>	
	Original Azeray: 50 40 30 20 10 Sorted Averay: 10 20 30 40 50
	30x+cq Aveay . 10 20 30 40 30
Λι	
Hogothm.	Maput
	Take an away of elements as input
7	11 1 Outer loop
	Start an outer loop from the second element
S. Ther	(index 1) to the last element (index n-1),
\$ \qua	where 'n' is the number at elements in
	ayeray
	iii Select Element :
* *	Select the current element from the unsorted
	Sub-overay, called as a key
2 e 3 1	iv Inner loop
	Staret an inner loop from the lurrent element
y .	index & move towards the begining at the
	averay [index] from 1 to 0
A TOTAL OF THE PARTY OF THE PAR	Compare the key with each element in the

: remarks to redining it reind : realist : I -tournes !! : 1 tramelle at of of of the lively the sold in the TO BY TO BE OF IL PLUS A HARR Jugalli : mettigo for Tugal 21 Edinamis for possi in artil Conclusion: Program of insertion sortis implemented & The could executed of successfully using Con Programming (Index 1 to the luce elemanagement), ri estemis for risdinan sit is in south in Street Exment : loriozari sitt anat. Johnsons 5. Farmer: sitt tostos Spir-sign , wild is a legal start un inner loop them the werent emperts ni te prinipis all strough syon & ali et i ment freshrit jourse Company the key much tout eleganists in the The rate the lotters

	If the key is smaller than the luwrent key!
	element move the sworest element one position
	ahead to make space for the key.
2	VIInsert key
- 7	Insert the key into it's correct position in
	the sorted sub-away.
i.	vilRepeat
	Report Steps 3-5 for each iteration of the
	outer Loop.
	viil The Output
1. 19	The array is sorted when outer loop completes.
Conclusion:	Program of insertion sort is implemented &
1 E-	executed successfully Using C Programming
	Language.
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× ×	
1 1 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	