**TITLE 16**

Write a C program to sort an array in ascending order using Insertion sort

**OBJECTIVE:**

By the end of this activity we will be able to Implement Insertion sort in C

**PROBLEM STATEMENT:**

In this problem we aim to create an array using the numbers given as user input and then using Insertion sort we arrange the elements in ascending order. It requires input from the user:

Enter the numbers:

Once input data is collected and sorted, the elements are stored in an array and sorted.

**ALGORITHM:**

START

Define variables: n.c,d,t,flag

INPUT: Read input from user

COMPUTATION: An array is formed from the elements entered by the user

DISPLAY: Sorted array of elements in ascending order

STOP

**PROGRAM:**

#include <stdio.h>

int main()  
{  
  int n, a[1000], c, d, t, flag = 0;

  printf("Enter number of elements**\n**");  
  scanf("%d", &n);

  printf("Enter the %d numbers:**\n**", n);

  for (c = 0; c < n; c++)  
    scanf("%d", &a[c]);

  for (c = 1 ; c <= n - 1; c++) {  
    t = a[c];

    for (d = c - 1 ; d >= 0; d--) {  
      if (a[d] > t) {  
        a[d+1] = a[d];  
        flag = 1;  
      }  
      else  
        **break**;  
    }  
    if (flag)  
      a[d+1] = t;  
  }

  printf("Sorted list in ascending order:**\n**");

  for (c = 0; c <= n - 1; c++) {  
    printf("%d**\n**", a[c]);  
  }

  return 0;  
}

**CONCLUSION:**

The simulation of the above program helped me to understand how we can use insertion sort to arrange elements in ascending order.

**OUTPUT:**

Enter number of elements

6

Enter the 6 numbers:

90

45

78

43

31

24

Sorted list in ascending order:

24

31

43

45

78

90