**Program – 3**

**Write an algorithm and program to sort n numbers using Bubble sort technique.**

**Algorithm**

Bubble Sort(a[],n)

For i=0 to n-1

Swap= false

For j=i+1 to n

If a[j-1] > a[j]

Swap(a[j-1],a[j])

Swap=true

Break if not swapped

**Code**

#include <stdio.h>

#define MAXSIZE 10

int main()

{

int array[MAXSIZE];

int i, j, num, temp;

printf("Enter the value of num \n");

scanf("%d", &num);

printf("Enter the elements one by one \n");

for (i = 0; i < num; i++)

{

scanf("%d", &array[i]);

}

printf("Input array is \n");

for (i = 0; i < num; i++)

{

printf("%d\n", array[i]);

}

/\* Bubble sorting begins \*/

for (i = 0; i < num; i++)

{

for (j = 0; j < (num - i - 1); j++)

{

if (array[j] > array[j + 1])

{

temp = array[j];

array[j] = array[j + 1];

array[j + 1] = temp;

}

}

}

printf("Sorted array is...\n");

for (i = 0; i < num; i++)

{

printf("%d\n", array[i]);

}

return 0;

}

**Implement recursion in the above question**

**Code**

#include<iostream>

#define MAXSIZE 50

using namespace std;

// A function to implement bubble sort

void bubbleSort(int arr[], int n)

{

// Base case

if (n == 1)

return;

// One pass of bubble sort. After this pass, the largest element is moved (or bubbled) to end.

for (int i=0; i<n-1; i++)

if (arr[i] > arr[i+1])

swap(arr[i], arr[i+1]);

// Largest element is fixed, recur for remaining array

bubbleSort(arr, n-1);

}

/\* Function to print an array \*/

void printArray(int arr[], int n)

{

for (int i=0; i < n; i++)

printf("%d ", arr[i]);

printf("\n");

}

int main()

{

int arr[MAXSIZE],n;

cout<<"enter the no of elements:";

cin>>n;

cout<<"enter the elements";

for(int i=0;i<n;i++)

{

cin>>arr[i];

}

bubbleSort(arr, n);

printf("Sorted array : \n");

printArray(arr, n);

return 0;

}