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/*
Que : Write a C program for Bubble Sort
Owner: Rushikesh Sanjay Pokharkar
Batch: PPA9

*/

// ***** Solution *****

#include<stdio.h> //Include Necessary Header Files.

void bubbleSort(int arr[], int n)
{
    // Logic to sort array in ascending order Using Bubble Sort.
    for (int i = 1; i < n; i++)
    {
        for (int j = 0; j < n - i; j++)
        {
            if (arr[j] > arr[j + 1])
            {
                int temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
            }
        }
    }
}

void main() {
    int arr[100], n; // Declaration of required variables.

    printf("How many Elements do you want in array?\n");
    scanf_s("%d", &n); // Take input - Number of array elements.

    printf("Enter Array Elements: \n");
    for (int i = 0; i < n; i++) // For loop to take input array elements.
    {
        scanf_s("%d", &arr[i]);
    }

    printf("Unsorted Array Elements are: ");

    for (int i = 0; i < n; i++) // For loop to print array elements.
    {
        printf("%d ", arr[i]);
    }

    printf("\nSorted Array In Ascending Order Using Bubble Sort: ");

    bubbleSort(arr, n); // function call for bubble sort

    for (int i = 0; i < n; i++) // For loop to print sorted array..
    {
        printf("%d ", arr[i]);
    }
    printf("\n");
}

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/*
Que : Write a C program for Insertion Sort
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*/

// ***** Solution *****

#include<stdio.h> //Include Necessary Header Files.

void insertionSort(int arr[], int n)
{
    // Logic to sort array in ascending order Using Insertion Sort.
    for (int i = 1; i < n; i++)
    {
        int temp = arr[i];
        int empty = i;

        while (empty > 0 && arr[empty - 1] > temp)
        {
            arr[empty] = arr[empty - 1];
            empty--;
        }
        arr[empty] = temp;
    }
}

void main() {
    int arr[100], n, min; // Declaration of required variables.

    printf("How many Elements do you want in array?\n");
    scanf_s("%d", &n); // Take input - Number of array elements.

    printf("Enter Array Elements: \n");
    for (int i = 0; i < n; i++) // For loop to take input array elements.
    {
        scanf_s("%d", &arr[i]);
    }

    printf("Unsorted Array Elements are: ");

    for (int i = 0; i < n; i++) // For loop to print array elements.
    {
        printf("%d ", arr[i]);
    }

    printf("\nSorted Array In Ascending Order Using Insertion Sort: ");

    insertionSort(arr, n); // Function call for Insertion sort.

    for (int i = 0; i < n; i++) // For loop to print sorted array..
    {
        printf("%d ", arr[i]);
    }
    printf("\n");
}

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/*

Que : Write a C program for selection Sort
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*/

// ***** Solution *****

#include<stdio.h> //Include Necessary Header Files.

void selectionSort(int arr[], int n)
{
    // Logic to sort array in ascending order Using Selection Sort.
    for (int i = 0; i < n - 1; i++)
    {
        for (int j = i + 1; j < n; j++)
        {
            if (arr[i] > arr[j]) {
                int temp = arr[i];
                arr[i] = arr[j];
                arr[j] = temp;
            }
        }
    }
}

void main() {

    int arr[100], n, min; // Declaration of required variables.

    printf("How many Elements do you want in array?\n");
    scanf_s("%d", &n); // Take input - Number of array elements.

    printf("Enter Array Elements: \n");
    for (int i = 0; i < n; i++) // For loop to take input array elements.
    {
        scanf_s("%d", &arr[i]);
    }

    printf("Unsorted Array Elements are: ");

    for (int i = 0; i < n; i++) // For loop to print array elements.
    {
        printf("%d ", arr[i]);
    }

    printf("\nSorted Array In Ascending Order Using Selection Sort: ");

    selectionSort(arr, n); // Function call for selection sort.

    for (int i = 0; i < n; i++) // For loop to print sorted array..
    {
        printf("%d ", arr[i]);
    }
}

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    }  
    printf("\n");  
}
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