C Program: Function – Call by Value

Calculating GCD of two numbers

```c
#include<stdio.h>

int calculate_gcd(int n1,int n2);

int main()
{
    int num1,num2,gcd_res;

    printf("Enter the two numbers \n");
    scanf("%d%d",&num1,&num2);

    printf("Calling function GCD\n");
    gcd_res=calculate_gcd(num1,num2);

    printf("The GCD of two numbers
%d and %d is %d\n",num1,num2,gcd_res);

} //end of main function
```

```c
int calculate_gcd(int n1,int n2)
{
    printf("Inside the function
calculate_gcd\n");

    int i,res;
    printf("Calculating GCD\n\n");

    for(i=1;i<=n1 && i<=n2;i++)
    {
        if(n1%i==0 && n2%i==0)
        {
            res=i;
        }
    }
    printf("Calculated the GCD, now
returning back to main function
\n\n\n");
    return res;
} //end of calculate_gcd function
```

```
Enter the two numbers
5
6
Calling the function to calculate GCD

Inside the function calculate_gcd
Calculating GCD now

Calculated the GCD, now returning back to main function
```

```
Enter the two numbers
5
6
Calling the function to calculate GCD

Inside the function calculate_gcd
Calculating GCD now

Calculated the GCD, now returning back to main function

The GCD of two numbers 5 and 6 is 1
```

```c
#include<stdio.h>

int calculate_gcd(int n1,int n2);

int main()
{
      int num1,num2,gcd_res;

      printf("Enter the two numbers \n");
      scanf("%d%d",&num1,&num2);

      printf("Calling function GCD \n");
      gcd_res=calculate_gcd(num1,num2);

      printf("The GCD of two numbers
%d and %d is %d\n", num1, num2, gcd_res);

} //end of main function
```

C Program : Function – Call by Reference

Calculating factorial of a number

```c
#include<stdio.h>
void calculate_factorial(int *n,
int *fact_res);
int main(){
    int num,fact_res=1;
    printf("Enter the number to find the
factorial\n");
    scanf("%d",&num);
    printf("Calling the function to calculate
factorial\n\n\n");

    if (num < 0){
         printf("Error! Factorial of a negative
number doesn't exist.");
    }
   else
    {
    calculate_factorial(&num,&fact_res);
    printf("The factorial of the number %d is
%d\n",num,fact_res);
    }
} //end of main function
```

```c
void calculate_factorial(int *n,int *fact_res)
{
    printf("Inside the function
calculate_factorial\n");
    int i;
    printf("Calculating factorial now\n\n");
    for(i=1;i<=*n;++i)
    {
        *fact_res *=  i;
    }
    printf("Calculated the factorial, now
returning back to main function\n\n\n");
} //end of calculate_factorial function
```

```
Enter the number to find the factorial
```

```
Enter the number to find the factorial
5
Calling the function to calculate factorial
```

```
Enter the number to find the factorial
5
Calling the function to calculate factorial

Inside the function calculate_factorial
Calculating factorial now
```

```
void calculate_factorial(int *n,int *fact_res)
{
    printf("Inside the function
calculate_factorial\n");
    int i;
    printf("Calculating factorial now\n\n");
    for(i=1;i<=*n;++i)
    {
        *fact_res *=  i;
    }
    printf("Calculated the factorial, now
returning back to main function\n\n\n");
} //end of calculate factorial function
```

```
#include<stdio.h>
void calculate_factorial(int *n,
int *fact_res);
int main(){
    int num,fact_res=1;
    printf("Enter the number to find the factorial\n");
    scanf("%d",&num);
    printf("Calling the function to calculate
factorial\n\n\n");

    if (num < 0){
        printf("Error! Factorial of a negative number doesn't
exist.");
    }
   else
   {
    calculate_factorial(&num,&fact_res);
    printf("The factorial of the number %d is
%d\n",num,fact_res);
   }
} //end of main function
```

```
Enter the number to find the factorial
5
Calling the function to calculate factorial


Inside the function calculate_factorial
Calculating factorial now

Calculated the factorial, now returning back to main function
```

```
Enter the number to find the factorial
5
Calling the function to calculate factorial


Inside the function calculate_factorial
Calculating factorial now

Calculated the factorial, now returning back to main function


The factorial of the number 5 is 120
```

```c
#include<stdio.h>
void calculate_factorial(int *n,
int *fact_res);
int main(){
      int num,fact_res=1;
      printf("Enter the number to find the
factorial\n");
      scanf("%d",&num);
      printf("Calling the function to
calculate factorial\n\n\n");

      if (num < 0){
         printf("Error! Factorial of a
negative number doesn't exist.");
      }
    else
    {
      calculate_factorial(&num,&fact_res);
      printf("The factorial of the number %d
is %d\n",num,fact_res);
    }
} //end of main function
```

C Program : Function – Call by Reference – Passing an Array

Sorting an array using Bubble Sort

```c
#include <stdio.h>
#include <stdlib.h>

void printArray(int array[], int size);
void bubbleSort(int array[], int size);

int main()
{
    printf("This is the main function\n");
    int array[5] = {-1, 5, 0, 10, -9};
    int size = sizeof(array) / sizeof(array[0]);
    printf("The length of the array is: %d\n",size);
    printf("Printing the array before sorting: \n");
    printArray(array, size);
    bubbleSort(array, size);
    printf("Printing the array after sorting in
Ascending Order:\n");
    printArray(array, size);
    return 0;
}
```

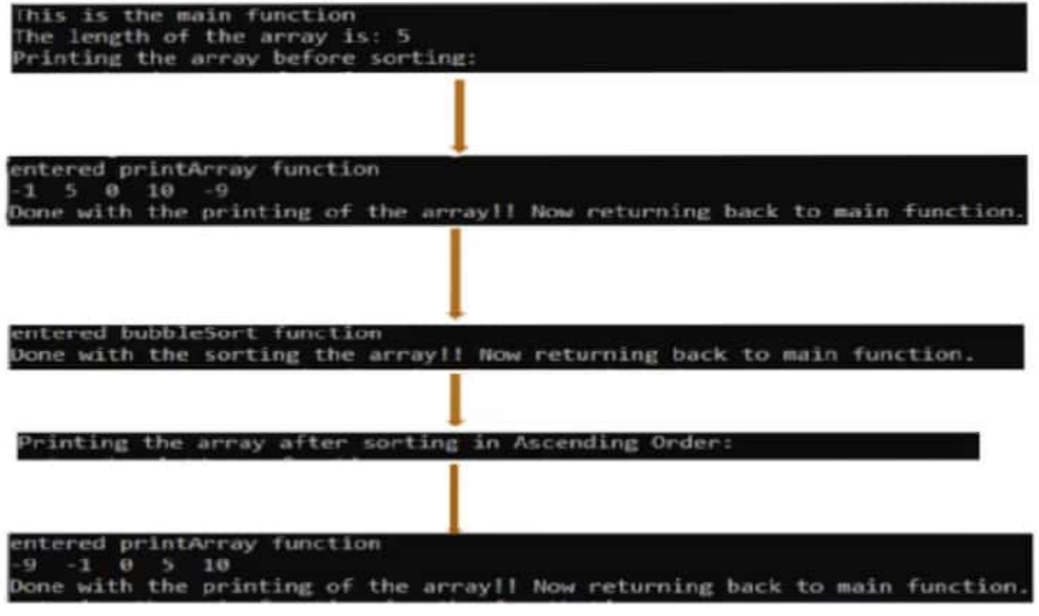
```
// Function to print array


void printArray(int array[], int size)
{
  printf("entered printArray function\n");

  for (int i = 0; i < size; i++)
     {
      printf("%d  ", array[i]);
     }
  printf("\n");
  printf("Done with the printing of the
 array!! Now returning back to main function.\n");
}
```

```
//Function for Bubble Sort

void bubbleSort(int array[], int size)
{
  printf("entered bubbleSort function\n");
  for (int j = 0; j < size - 1; j++)
    {
      for (int i = 0; i < size - j - 1; i++)
       {
         if (array[i] > array[i + 1])
         {
           int temp = array[i];
           array[i] = array[i + 1];
           array[i + 1] = temp;
         }
       }
     }
     printf("Done with the sorting the array!! Now
returning back to main function.\n");
}
```




```c
#include <stdio.h>
#include <stdlib.h>

void printArray(int array[], int size);
void bubbleSort(int array[], int size);

int main()
{
    printf("This is the main function\n");
    int array[5] = {-1, 5, 0, 10, -9};
    int size = sizeof(array) / sizeof(array[0]);
    printf("The length of the array is: %d\n",size);
    printf("Printing the array before sorting: \n");
    printArray(array, size);
    bubbleSort(array, size);
    printf("Printing the array after sorting in
Ascending Order:\n");
    printArray(array, size);
    return 0;
}
```