



SNS COLLEGE OF TECHNOLOGY

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COURSE NAME : 19CST101 PROGRAMMING FOR PROBLEM SOLVING

I YEAR/ I SEMESTER

UNIT-IV FUNCTIONS AND POINTERS

Topic: Functions

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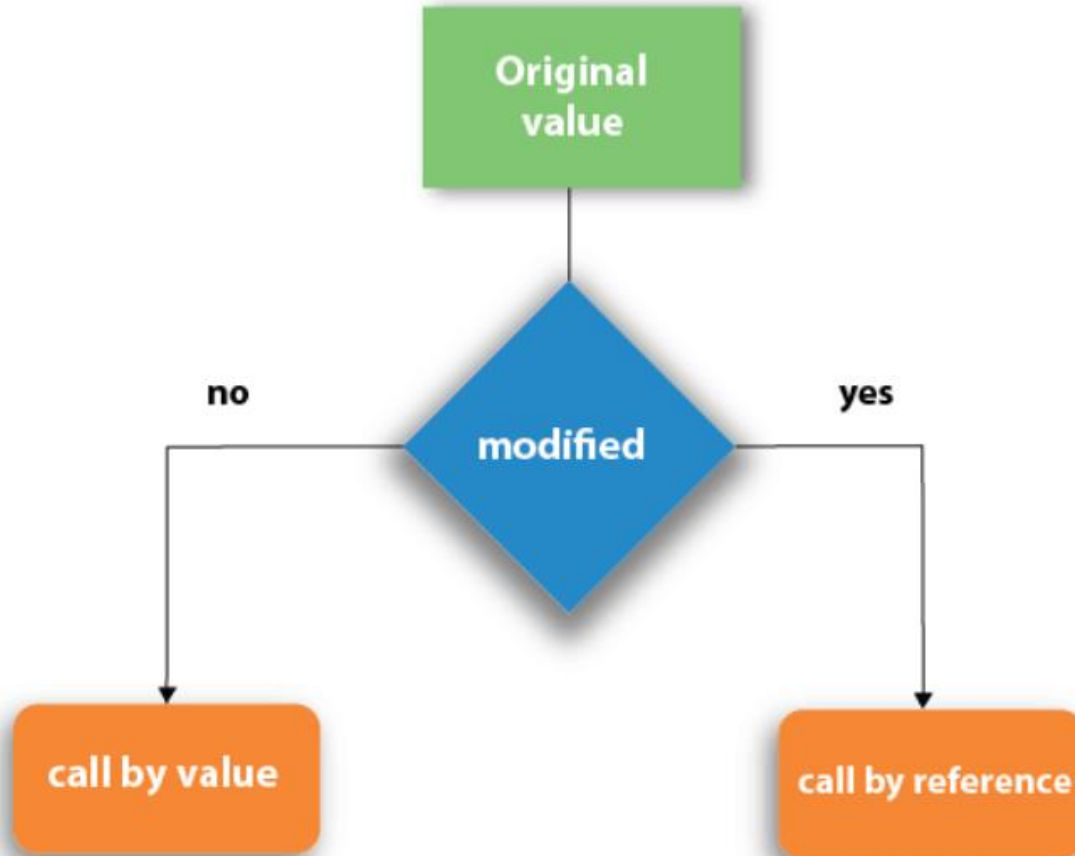
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Functions

There are two methods to pass the data into the function in C language, i.e., *call by value* and *call by reference*.





Functions



Call By Reference

- In call by reference, the address of the variable is passed into the function call as the actual parameter.
- The value of the actual parameters can be modified by changing the formal parameters since the address of the actual parameters is passed.
- In call by reference, the memory allocation is similar for both formal parameters and actual parameters. All the operations in the function are performed on the value stored at the address of the actual parameters, and the modified value gets stored at the same address.



Call by reference Example: Swapping the values of the two variables



```
#include <stdio.h>
void swap(int *, int *); //prototype of the function
int main()
{
    int a = 10;
    int b = 20;
    printf("Before swapping the values in main a = %d, b = %d\n",a,b); // printing the value of a and b in main
    swap(&a,&b);
    printf("After swapping values in main a = %d, b = %d\n",a,b); // The values of actual parameters do change in call
}
void swap (int *a, int *b)
{
    int temp;
    temp = *a;
    *a=*b;
    *b=temp;
    printf("After swapping values in function a = %d, b = %d\n",*a,*b); // Formal parameters, a = 20, b = 10
}
```

Output

```
Before swapping the values in main a = 10, b = 20
After swapping values in function a = 20, b = 10
After swapping values in main a = 20, b = 10
```



Advantages of using Call by reference method

Pros of using call by reference method:

- The function can change the value of the argument, which is quite useful.
- It does not create duplicate data for holding only one value which helps you to save memory space.
- In this method, there is no copy of the argument made. Therefore it is processed very fast.
- Helps you to avoid changes done by mistake
- A person reading the code never knows that the value can be modified in the function.



Disadvantages of using Call by reference method

Here, are major cons of using call by reference method:

- ❑ Strong non-null guarantee. A function taking in a reference need to make sure that the input is non-null. Therefore, null check need not be made.
- ❑ Passing by reference makes the function not pure theoretically.
- ❑ A lifetime guarantee is a big issue with references. This is specifically dangerous when working with lambdas and multi-threaded programs.



Thank You!