Difference Between Call by Value and Call by Reference

In languages such as C++ or Java, either call by reference or call by value approaches can be used based on the requirement of the programmer. Let us now see the difference between call by value and call by reference in the following table in order to know where to use which method for better results:

Key Differences Between Call by Value and Call by Reference

Call by Value	Call by Reference
Copying variables pass values.	Values are passed by copying the address of the variables.
Copies are passed.	Variable is passed.
Changes do not reflect the original function.	Changes affect the variable of the function.
The actual variable can not be changed	The actual variable can be modifiedS.
The argument is also safe from the changes.	The argument also changes with a change in the called function.
The different memory location is used to create the actual and formal arguments.	The same memory location will be used.
Used in C++, PHP, C#, etc.	Used in Java, C++, etc.

What is Call by Value?

Call by value is known as the method for parameter passing. In this method of calling by value, the actual parameter's value is copied in the formal parameters. In this, a different memory is allocated for each type of parameter. The advantage of using the call-by-value method is that the original variable does not change with the change in calling by value.

In this method, it is impossible to change or modify the actual parameter's value by using a formal parameter. The actual value of the actual argument is not varied either. Let us see an example of a Call by value"

Input:

void main() {
int a = 5,
void decrement(int);

```
Cout << "before function calling" << a;
increment(a);
Cout << "after function calling" << a;
getch();

void increment(int x) {
int x = x - 1;
Cout << "value is" << x;
}
```

Output:

before function calling 5
value is 5
after function calling 4

What is Call by Reference?

Call by reference is also a method for parameter passing. In this method address or reference is passed to a function. The call by reference parameter is also known as the pointer variable. The original value of the function changes with a call by reference. In languages such as C++ or Java, call by reference is preferred to call by value.

Let us see the example of call by reference before finally reading about the difference between call by value and call by reference.

Input:

```
void swap(int *c, int *d){

int temp;

temp=*c;

*c=*d;

*d=temp;

}

void main(){

int c=200, d=400;

swap(&a, &b); // passing value to function

printf("nValue of a: %d",a);

printf("nValue of b: %d",b);

}
```

Output:

Value of a: 400
Value of b: 200