Optimization Techniques | Set 2 (swapping)

How to swap two variables?

The question may look silly, neither geeky. See the following piece of code to swap two integers (XOR swapping),

```
void myswap(int *x, int *y)
{
   if (x != y)
   {
      *x^=*y^=*x^=*y;
   }
}
```

At first glance, we may think nothing wrong with the code. However, when prompted for reason behind opting for XOR swap logic, the person was clue less. Perhaps any ***commutative*** operation can fulfill the need with some corner cases.

Avoid using fancy code snippets in production software. They create runtime surprises. We can observe the following notes on above code

1. The code behavior is undefined. The statement `*x^=*y^=*x^=*y;` modifying a variable more than once in without any sequence point.
2. It creates pipeline stalls when executed on a processor with pipeline architecture.
3. The compiler can't take advantage in optimizing the swapping operation. Some processors will provide single instruction to swap two variables. When we opted for standard library functions, there are more chances that the library would have been optimized. Even the compiler can recognize such standard function and generates optimum code.
4. Code readability is poor. It is very much important to write maintainable code.

Thanks to **Venki** for writing the above article. Please write comments if you find anything incorrect, or you want to share more information about the topic discussed above.

Practice Tags : CPP

Article Tags : C++ XOR

Please write to us at contribute@geeksforgeeks.org to report any issue with the above content. Login to Improve this Article

Recommended Posts:

ASCII NUL, ASCII 0 (‘0’) and Numeric literal 0
Program to validate an IP address
Quine – A self-reproducing program
How Linkers Resolve Global Symbols Defined at Multiple Places?
Sequence Points in C | Set 1
unordered_set max_size() in C++ STL
isinf() function in C++
isnormal() in C++
isunordered() function in C++
isfinite() function in C++

(Login to Rate)

3.6 Average Difficulty : **3.6/5.0**
Based on **5** vote(s)

Basic Easy Medium Hard Expert

Add to TODO List
Mark as DONE

Feedback Add Notes Improve Article

Writing code in comment? Please use ide.geeksforgeeks.org, generate link and share the link here.

Share this post!

4 Comments **GeeksforGeeks** 1 **Login**

Recommend Tweet Share **Sort by Newest**

mani • 5 years ago

b=a+b-(a=b);

Reply • Share ›

Sriraj Hebbar • 7 years ago

Hey check this,Fibonacci generation without using 3rd variable

```
int main()
{
 int n,a=-1,b=1;
 clrscr();
 printf("Enter the limit\n");
 scanf("%d",&n)
 while(n--)
 {
 a+=b;
 printf("%d\n",a);
 a+=b;
 b=a-b;
 a-=b;
 }
 return 0;
}
```

Reply • Share ›

Prasoon • 8 years ago

> The code behavior is implementation defined. The statement *x^=*y^=*x^=*y; modifying a variable more than once in without any sequence point.

Wrong! The behaviour is rather undefined. Read this thread :http://stackoverflow.com/qu...

and this (http://stackoverflow.com/qu... understand the difference between Undefined Behaviour and Implementation Defined Behaviour

Reply • Share ›

Venki ➚ Prasoon • 8 years ago

@Prasoon, thanks for the link. We will correct the phrasing to "undefined".

Our intent is to avoid such type of coding, unless we are sure what we are doing.

Reply • Share ›