

Code Step By Step Question

In code step by step problem stretch:

<http://www.codestepbystep.com/problem/view/cpp/collections/vector/stretch>

This failed 1 out of 4 tests:

```
void stretch(Vector<int>& v){
    int n=v.size();
    for(int i=0;i<2*n;i=i+2){
        if(v[i]%2==0){
            v[i]=v[i]/2;
            v.insert(i+1,v[i]); // Code will work if change this line into
            //    int n=v[i];v.insert(i+1,n);
        }
        else{
            v[i]=v[i]/2+1;
            v.insert(i+1,v[i]-1);
        }
    }
}
```

When it fails, output messages are like these:

```
test #1:stretch({18, 7, 4, 24, 11});
exp. params:{9, 9, 4, 3, 2, 2, 12, 12, 6, 5}
your parameters:{9, 0, 4, 3, 2, 2, 12, 12, 6, 5}
result: fail
test #2:stretch({1, 2, 3, 4, 5, 6});
parameters:{1, 0, 1, 1, 2, 1, 2, 2, 3, 2, 3, 3}
result: pass
test #3:stretch({43});
parameters:{22, 21}
result: pass
test #4:stretch({});
parameters:{}
result: pass
My question is: Why isn't  $v.insert(i+1, v[i])$ ; equivalent to  $int\ n=v[i]; v.insert(i+1, n);$  ?
Thanks!
Holly
```

other

Updated Just now by Chris Gregg and Holly Liang

the instructors' answer, where instructors collectively construct a single answer

This is a *very* interesting question, as it turns out. When I ran your original code on my computer, I actually got the correct answer, but when it is run on CodeStepByStep, the answer is incorrect, as you noted. It may be because we are using a different version of the Vector library than CodeStepByStep, but you do have to be a bit careful with this. I will actually email the creator of CodeStepByStep (Marty Stepp, who is another lecturer in the CS department) to ask him about it.

I believe that what you have stumbled upon is called a "race condition." You are trying to modify the vector by reading from the vector at the same time, and this can cause issues because under the hood doing things simultaneously like that is undefined behavior.

So, in this case it is better to get the value out of the vector into a temporary variable first, and then to perform the insert.

Incidentally, you probably don't want to use the variable "n" inside the for loop, as you are creating two n variables, and this could get confusing.

I'll let you know what I find out from Marty.

-Chris

Updated Just now by Chris Gregg

followup discussions for lingering questions and comments