TopCoder Data Structures Competitive Programming

What is the simplest implementation of segment trees that you have seen?

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Muhamed Keta, twice BOI participant, generally awesome and looking for programming fun :D

Answered May 27, 2015

I recently wrote a blog article on this matter, and I believe it has a nice implementation (without 5 parameters and 70 lines of code).

Segment Tree - An efficient contest approach

The main idea is that instead of using recursion to build and rebuild the tree, we use simple loops. This is memory-efficient and way easier to code.
For example the whole build function is one line, and you can have direct access to the elements. It is basically the same idea but a different style of coding.

```
void build()
{
 for(int i = n - 1; i > 0; i--) t[i] = t[i<<1] + t[i<<1|1];
}
```

You can read the article for the rest of code.

Segment Tree - An efficient contest approach

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Anonymous

Answered Sep 6, 2015

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What are some good tutorials on segment trees?

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in the given time.

I saw this implementation in the Codeforces discussion blog. It has been written by a person with red rating on Codeforces. It doesn't involve any recursive call and it is hardly 10 lines of code.

Efficient and easy segment trees - Codeforces

Do give a thumbs up if it helps!

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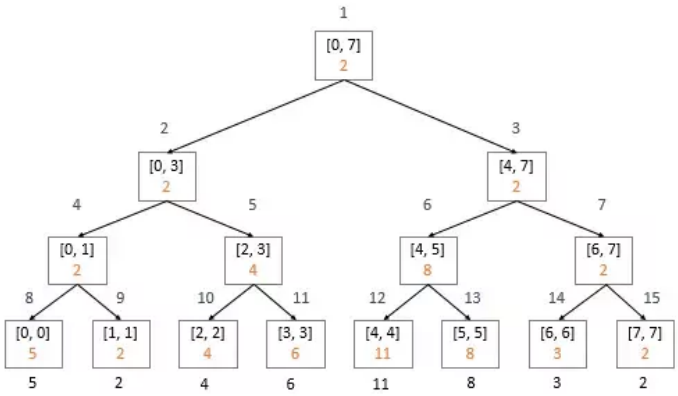
Kartik Chaudhary, I like Competitive Programming
Answered Sep 12, 2016

You can find a simple implementation of segment tree for **RMQ** (Range Minimum Query)with **explanation** here along with the **Lazy Propagation**.

https://kartikgill3.blogspot.in/...



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Dhruv Matani, Kuriosity
Answered Feb 20, 2013

This has to be it: Segment Tree - Algorithm Tutorials .

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Amol Upraity (अमोल उप्रेती), Software Developer at Qualcomm (2018-present)
Answered Jul 29, 2016

If you have no knowledge of segment tree, following iterative impleentation is best of all:

Efficient and easy segment trees - Codeforces

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Waqas Hamid, former Technology Lead at Edernity (2017)
Answered Feb 7, 2017

I have wasted a lot of time over this. A lot!!
Just take 15 mins to go through this peacefully.
This is the easiest, simplest, most efficient (time & space complexity) implementation for me.
Believe me!
Cheers :)

```
/* Waqas Hamid */
/* beginner007*/

#include<bits/stdc++.h>
#define LL long long int
#define INF 1e18

using namespace std;

void buildMinSegTree(LL arr[], LL segtree[], LL n)
{
    LL i;
    for(i=n;i<2*n;i++)
    segtree[i]=arr[i-n];
    for(i=n-1;i>=0;i--)
    segtree[i]=min(segtree[2*i],segtree[2*i+1]);
}

void buildMaxSegTree(LL arr[], LL segtree[], LL n)
{
        LL i;
    for(i=n;i<2*n;i++)
    segtree[i]=arr[i-n];
    for(i=n-1;i>=0;i--)
    segtree[i]=max(segtree[2*i],segtree[2*i+1]);
}

void updateMinTree(LL segtree[],LL n, LL idx, LL val)
```

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```
    {
        idx/=2;
        segtree[idx] = min(segtree[2*idx], segtree[2*idx+1]);
    }

}

LL RMinQ(LL segtree[],LL n, LL left, LL right)
{
    left = left + n;
    right = right + n;
    LL minElement = INF;

    while(left<right)
    {
        if(left % 2 != 0)
        minElement = min(minElement, segtree[left]);
        if(right % 2 != 0)
        minElement = min(minElement, segtree[right]);
        left/=2;
        right/=2;
    }

    return minElement;
}

LL RMaxQ(LL segtree[],LL n, LL left, LL right)
{
    left = left + n;
    right = right + n;
    LL maxElement = 0;

    while(left<right)
    {
        if(left % 2 != 0)
        maxElement = max(maxElement, segtree[left]);
        if(right % 2 != 0)
        maxElement = max(maxElement, segtree[right]);
        left/=2;
        right/=2;
    }

    return maxElement;
}

int main()
{
    LL n,i;
    cin>>n;

    LL arr[n];
    LL segtree[2*n];

    for(i=0 ; i<n ; i++)
    cin>>arr[i];

    buildMinSegTree(arr,segtree,n);

    for(i=0 ; i<2*n ; i++)
    cout<<segtree[i]<<" ";
```

```
97      for(i=0;i<2*n;i++)
98      cout<<segtree[i]<<" ";
99
100     cout<<endl;
101     cout<<RMinQ(segtree,4 , 3, 9)<<endl;
102
103     buildMaxSegTree(arr,segtree,n);
104
105     for(i=0 ; i<2*n ; i++)
106     cout<<segtree[i]<<" ";
107
108     cout<<endl<<RMaxQ(segtree,4 , 3, 9)<<endl;
109
110 }
```

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Kartik Kukreja, Is in awe of some data structures
Answered Nov 9, 2014

I have written a tutorial on segment trees: A simple approach to segment trees .
I hope you find it simple enough.

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Harsh Ramchandani, Software Engineer
Answered Apr 25, 2015

Read this link: Segment tree - PEGWiki

It is explained beautifully here.

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Tanay Agrawal, Young Pythonist
Answered Nov 15, 2016

Segment Trees and lazy propagation

Great Implementation

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Here is an implementation of segment tree to solve the range minimum query problem.

http://www.learn4master.com/algo...

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Abhishek Jaisingh, Seasoned Programmer
Answered Jun 24, 2015

Geeks for Geeks has the best and most simple implementation of segment trees.
Here is the link :
Segment Tree | Set 1 (Sum of given range) - GeksforGeeks

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Bob Collins, MD Medical School, Medical College of Virginia (1989)
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I once went into an exam room to see a teenage girl, accompanied by her father, whom I'd never seen before. He immediately lit into me about how she's

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