note @145 150 views

PA3 - 3003 Discussion Thread

Dynamic Tree

Description

In a dynamic tree, four operations is expected.

- insert an element
- delete an element
- query the rank of a given element.
- query the element by a given rank. (When does not exist, decrease the rank until it exists.)
- query the size

The 'rank' of an element is defined as the number of elements that are smaller than it. For example, in a tree below

rank(0001)=0, rank(0002)=1, rank(0004)=2, rank(0005)=4, rank(0007)=7

kth(0)=0001, kth(1)=0002, kth(2)=0004, kth(3)=0004, kth(4)=0005, kth(5)=0005, kth(6)=0005,kth(7)=0007

Switch the language below to c++ to see the template.

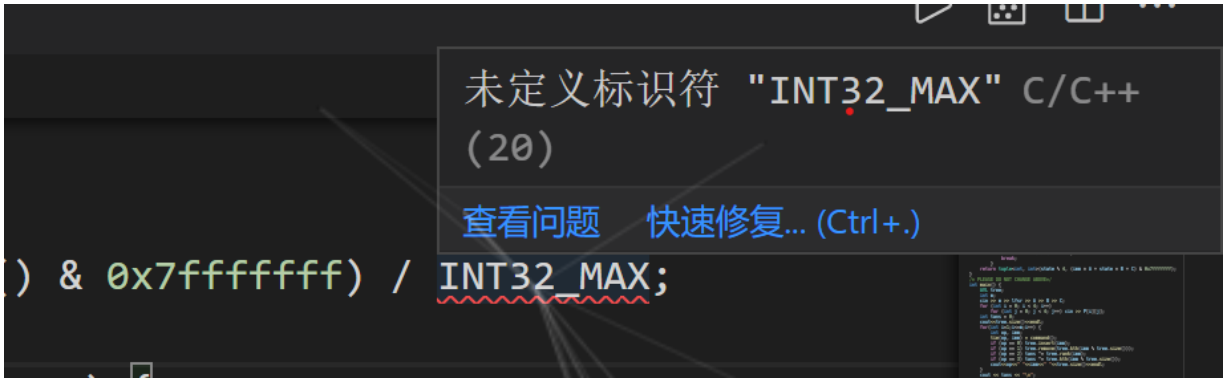
programming

Updated 20 days ago by Yining She (佘以宁)

followup discussions *for lingering questions and comments* **1 endorsed followup comment**

Resolved Unresolved

陈 正 19 days ago



how to deal with it?

thanks a lot.

helpful! | 0

龚 可 19 days ago

https://stackoverflow.com/questions/3233054/error-int32-max-was-not-declared-in-this-scope/3233069

helpful! | 0

龚 可 19 days ago

This is something that might be defined in `climits` or `cstdint`. I often use the `INT_MAX` defined in `climits`. In most cases the type `int` is implemented as 32-bit so `INT_MAX` is almost the same with `INT32_MAX`. But in the stackoverflow post some people mentioned that these macros may be undefined under some circumstances, which I'm not very sure about.

If you still have difficulty dealing with this, just replace it with `2147483647`.

helpful! | 0

陈 正 19 days ago thanks a lots.

helpful! | 0

Resolved Unresolved

彭 程 19 days ago
Is it ok to implement other DS instead of AVL tree?

helpful! | 0

龚 可 18 days ago
I think it is ok. I even use something that is not a bst.

helpful! | 0

郑瑜婷 17 days ago
It's ok not to use AVL.

good comment | 0

Resolved Unresolved

胡锦添 17 days ago

helpful! | 3

Resolved Unresolved

陈 正 16 days ago

```
        tie(op, imm) = command();
        if (op == 0) tree.insert(imm);
        if (op == 1) tree.remove(tree.kth(imm % tree.size()));
        if (op == 2) tans ^= tree.rank(imm);
        if (op == 3) tans ^= tree.kth(imm % tree.size());
    }
    cout << tans << "\n";
```

这个随机算法一定保证imm一定在之前添加过，所以tree.rank(imm)一定会返回一个有效值吗?

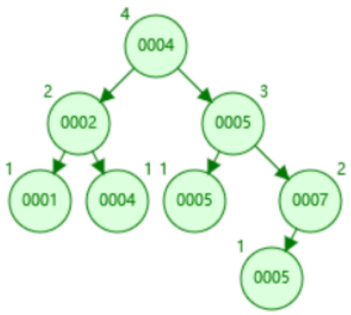
helpful! | 0

陈 正 16 days ago 还是说如果没找到就返回0

helpful! | 0

郑瑜婷 16 days ago

The 'rank' of an element is defined as the number of elements that are smaller than it. For example, in a tree below



In this case, rank(0003) = 2

good comment | 1

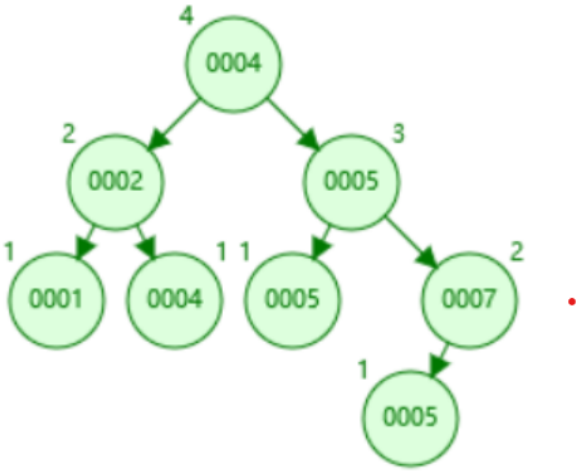
陈 正 16 days ago oh,I'm sorry not see it.

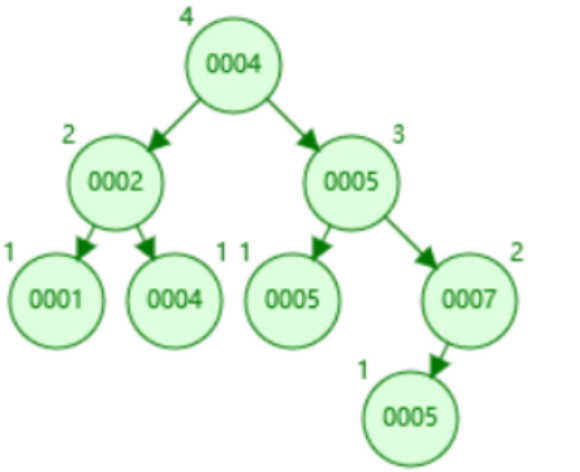
helpful! | 0

Resolved Unresolved

陈 正 16 days ago

If I remove 4,which 4 should I remove?or remove all 4?





helpful! | 0

郑瑜婷 16 days ago

Either is ok. (Choose one node to delete)

good comment | 0

陈 正 16 days ago But if I remove one 4,rank(5)=3,if I remove all 4,rank(5)=2,which will produce different resuilt.

helpful! | 0

Suting Chen 16 days ago You can only choose one to delete, which will not affect your result :)

helpful! | 0

陈 正 15 days ago But in my code,I remove all 4,which could get 60 scores,and others is Time limit,so it makes me confused about how to do?

helpful! | 0

龚 可 15 days ago

“Either is ok” means removing either of the two 0004’s is ok. And TA has stressed that you should CHOOSE ONE NODE to delete. It does not mean that “either removing one or removing all is ok”.

helpful! | 0

Resolved Unresolved

zhaoyao 9 days ago
Loading
The value being inserted can't be negative, or it can be negative?

helpful! | 0

Anonymous Gear 8 days ago I think it doesn't matter if you use AVL

helpful! | 0

胡锦添 8 days ago
Can’t

```
return tuple<int, int>(state % 4, (imm * A + state * B + C) & 0x7fffffff);
```

run code snippet

~ An instructor (郑瑜婷) thinks this is a good comment ~

helpful! | 1

龚 可 7 days ago
I think the values cannot be negative since for op=1 it directly use `imm % size()` to be a valid k, instead of `(imm % size() + size()) % size()`.

helpful! | 0

Resolved Unresolved

Anonymous Mouse 7 days ago
Could you specify the range of the elements inserted?

helpful! | 0

郑瑜婷 7 days ago
int

good comment | 0

Anonymous Mouse 7 days ago I mean the maximum value

helpful! | 0

郑瑜婷 7 days ago
`INT_MAX`

good comment | 0