

## 标签 线段树 下的文章

🏠 首页 (<https://blog.orzsiyuan.com/>) / 线段树

「2019 Multi-University Training Contest 2」Longest Subarray  
(<https://blog.orzsiyuan.com/archives/2019-Multi-University-Training-Contest-2-Longest-Subarray/>)

题目链接: HDU 6602 (<http://acm.hdu.edu.cn/showproblem.php?pid=6602>)

你有一个长度为  $n$  的序列  $a$  和两个整数  $C, K$  满足序列中的所有元素  $1 \leq a_i \leq C$ 。

我们定义一个连续子序列  $a_l, a_{l+1}, \dots, a_r$  是「好的」当且仅当:

$$\forall x \in [1, C], \sum_{i=l}^r [a_i = x] = 0 \text{ 或 } \sum_{i=l}^r [a_i = x] \geq K$$

抽象地, 如果一个数字在子序列中出现过, 那么它的出现次数必须不少于  $K$  次。

他需要求出「好的」连续子序列的最长长度。

本题有多组数据。

数据范围:  $1 \leq n, C, K \leq 10^5$ ,  $1 \leq a_i \leq C$ ,  $1 \leq \sum n, \sum C, \sum K \leq 5 \times 10^5$ 。

👤 Siyuan (<https://blog.orzsiyuan.com/author/1/>) © 2019 年 07 月 29 日

「NOI 2018」你的名字 (<https://blog.orzsiyuan.com/archives/NOI-2018-Your-Name/>)

题目链接: UOJ 395 (<http://uoj.ac/problem/395>)

小 A 被选为了 ION2018 的出题人, 他精心准备了一道质量十分高的题目, 且已经把除了题目命名以外的工作都做好了。

由于 ION 已经举办了很多届, 所以在题目命名上也是有规定的, ION 命题手册规定: 每年由命题委员会规定一个小写字母字符串, 我们称之为那一年的命名串, **要求每道题的名字必须是那一年的命名串的一个非空连续子串, 且不能和前一年的任何一道题目的名字相同。**

由于一些特殊的原因，小 A 不知道 ION2017 每道题的名字，但是他通过一些特殊手段得到了 ION2017 的命名串，现在小 A 有  $Q$  次询问：每次给定 ION2017 的命名串  $S$  和 ION2018 的命名串  $T$ ，求有几种题目的命名，使得这个名字一定满足命题委员会的规定，即是 ION2018 的命名串的一个非空连续子串且一定不会和 ION2017 的任何一道题目的名字相同。

由于一些特殊原因，所有询问给出的 ION2017 的命名串都是某个串  $S[l \dots r]$ 。

数据范围：  $1 \leq |S| \leq 5 \times 10^5$ ,  $1 \leq Q \leq 10^5$ ,  $\sum |T| \leq 10^6$ ,  $1 \leq l \leq r \leq |S|$ 。

👤 Siyuan (<https://blog.orzsiyuan.com/author/1/>) ⌚ 2019 年 05 月 17 日

## 「Codeforces 700E」Cool Slogans (<https://blog.orzsiyuan.com/archives/Codeforces-700E-Cool-Slogans/>)

题目链接：Codeforces 700E (<https://codeforces.com/contest/700/problem/E>)

Bomboslav 成立了一个品牌代理商，正在帮助公司创建商标和广告。就这个问题而言，公司的广告应该是其名称的非空子串。

有时，公司会对品牌进行重塑并改变广告。如果广告  $B$  作为子串在广告  $A$  中出现至少 2 次（允许重叠），那么认为广告  $A$  比  $B$  更酷。

你得到了某个公司的名字  $w$ ，你的任务是帮助 Bomboslav 确定最长的广告序列  $s_1, s_2, \dots, s_k$  满足任何一个广告都比上一个更酷。

数据范围：  $1 \leq |w| \leq 2 \times 10^5$ 。

👤 Siyuan (<https://blog.orzsiyuan.com/author/1/>) ⌚ 2019 年 05 月 02 日

## 「Codeforces 1073G」Yet Another LCP Problem (<https://blog.orzsiyuan.com/archives/Codeforces-1073G-Yet-Another-LCP-Problem/>)

题目链接：Codeforces 1073G (<https://codeforces.com/contest/1073/problem/G>)

定义  $LCP(s, t)$  字符串  $s$  和  $t$  的最长公共前缀，再定义  $s[x \dots y]$  为字符串  $s$  从位置  $x$  到  $y$  的子串。

给定一个长度为  $n$  的字符串  $s$  和  $q$  个询问。每次询问给出两个长度分别为  $k_i, l_i$  的序列  $a, b$ 。你需要计算  $\sum_{i=1}^k \sum_{j=1}^l LCP(s[a_i \dots n], s[b_j \dots n])$  的值。

数据范围：  $1 \leq n, q, \sum k_i, \sum l_i \leq 2 \times 10^5$ ,  $1 \leq k_i, l_i \leq n$ 。

👤 Siyuan (<https://blog.orzsiyuan.com/author/1/>) ⌚ 2019 年 04 月 16 日

# 「ZJOI 2019」线段树 (<https://blog.orzsiyuan.com/archives/ZJOI-2019-Segment-Tree/>)

题目链接: LOJ 3043 (<https://loj.ac/problem/3043>)

九条可怜是一个喜欢数据结构的女孩子, 在常见的数据结构中, 可怜最喜欢的就是线段树。

线段树的核心是懒标记, 下面是一个带懒标记的线段树的伪代码, 其中 `tag` 数组为懒标记:

---

```

1: function PUSHDOWN(Node)
2:   if tag[Node] = 1 then
3:     tag[Lson(Node)] ← 1
4:     tag[Rson(Node)] ← 1
5:     tag[Node] ← 0
6:   end if
7: end function
8:
9: function MODIFY(Node, l, r, ql, qr)
10:  if [l, r] ∩ [ql, qr] = ∅ then
11:    return
12:  end if
13:  if [l, r] ⊆ [ql, qr] then
14:    tag[Node] ← 1
15:    return
16:  end if
17:  m ← ⌊ $\frac{l+r}{2}$ ⌋
18:  PUSHDOWN(Node)
19:  MODIFY(Lson(Node), l, m, ql, qr)
20:  MODIFY(Rson(Node), m + 1, r, ql, qr)
21: end function

```

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其中函数 `Lson(Node)` 表示 `Node` 的左儿子, `Rson(Node)` 表示 `Node` 的右儿子。

现在可怜手上有一棵  $[1, n]$  上的线段树, 编号为 1。这棵线段树上的所有节点的 `tag` 均为 0。接下来可怜进行了  $m$  次操作, 操作有两种:

- 1  $l\ r$ , 假设可怜当前手上有  $t$  棵线段树, 可怜会把每棵线段树复制两份 (`tag` 数组也一起复制), 原先编号为  $i$  的线段树复制得到的两棵编号为  $2i - 1$  与  $2i$ , 在复制结束后, 可怜手上一共有  $2t$  棵线段树。接着, 可怜会对所有编号为奇数的线段树进行一次 `Modify(root, 1, n, l, r)`。
- 2, 可怜定义一棵线段树的权值为它上面有多少个节点 `tag` 为 1。可怜想要知道她手上所有线段树的权值和是多少。

数据范围:  $1 \leq n, m \leq 10^5$ 。

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## 「CodeChef GERALD07」 Chef and Graph Queries (<https://blog.orzsiyuan.com/archives/CodeChef-GERALD07-Chef-and-Graph-Queries/>)

题目链接: CodeChef GERALD07 (<https://www.codechef.com/problems/GERALD07>)

大厨有一个无向图  $G$ 。顶点从 1 到  $n$  标号, 边从 1 到  $m$  标号。

大厨有  $q$  对询问  $L_i, R_i$ 。对于每对询问, 大厨想知道当仅保留编号  $X$  满足  $L_i \leq X \leq R_i$  所在的边时, 图  $G$  中有多少连通块。

**注意数据可能包含自环和重边!**

本题有  $T$  组数据。

数据范围:  $1 \leq T \leq 10^3$ ,  $1 \leq n, m, q \leq 2 \times 10^5$ ,  $1 \leq L_i \leq R_i \leq M$ , 所有的  $n, m, q$  的和均不超过  $2 \times 10^5$ 。

👤 Siyuan (<https://blog.orzsiyuan.com/author/1/>) ⌚ 2019 年 03 月 29 日

## 「Codeforces 280D」 K-Maximum Subsequence Sum (<https://blog.orzsiyuan.com/archives/Codeforces-280D-K-Maximum-Subsequence-Sum/>)

题目链接: Codeforces 280D (<https://codeforces.com/contest/280/problem/D>)

你有一个长度为  $n$  的序列  $a_i$ , 接下来进行  $m$  次操作, 操作分为如下 2 种:

- 0 i val: 将第  $i$  个数  $a_i$  修改为  $val$ 。
- 1 l r k: 你需要在序列  $a_l, a_{l+1}, \dots, a_r$  中找出至多  $k$  个不相交的子序列, 使得他们的和最大。形式化地, 你需要找出至多  $k$  对  $(x_1, y_1), (x_2, y_2), \dots, (x_t, y_t)$  (其中  $l \leq x_1 \leq y_1 < x_2 \leq y_2 < \dots < x_t \leq y_t \leq r$ ,  $0 \leq t \leq k$ ), 使得  $(a_{x_1} + a_{x_1+1} + \dots + a_{y_1}) + (a_{x_2} + a_{x_2+1} + \dots + a_{y_2}) + \dots + (a_{x_t} + a_{x_t+1} + \dots + a_{y_t})$  的值最大。

特别地, 你可以选择 0 个子序列, 这时和式等于 0。

数据范围:  $1 \leq n, m \leq 10^5$ ,  $|a_i, val| \leq 500$ ,  $1 \leq k \leq 20$ , 求  $k$  个子序列和的操作不超过  $10^4$  个。

👤 Siyuan (<https://blog.orzsiyuan.com/author/1/>) ⌚ 2019 年 03 月 19 日

## 「SPOJ 10628」 COT - Count on a Tree (<https://blog.orzsiyuan.com/archives/SPOJ-10628-COT/>)

题目链接: SPOJ 10628 (<https://www.spoj.com/problems/COT/>)

你有一棵  $n$  个节点的树，节点从 1 到  $n$  编号。每个点都有一个权值  $a_i$ 。现在有  $m$  个询问，每个询问形如：

- $u\ v\ k$ ：求节点  $u, v$  之间的路径上的第  $k$  小权值。

数据范围：  $1 \leq n, m \leq 10^5$ 。

👤 Siyuan (<https://blog.orzsiyuan.com/author/1/>) © 2019 年 03 月 18 日

「Codeforces 813E」 Army Creation  
(<https://blog.orzsiyuan.com/archives/Codeforces-813E-Army-Creation/>)

题目链接：Codeforces 813E (<https://codeforces.com/contest/813/problem/E>)

Vova 非常喜欢玩电脑游戏，现在他正在玩一款叫做 Rage of Empires 的策略游戏。

在这个游戏里，Vova 可以雇佣  $n$  个不同的战士，第  $i$  个战士的类型为  $a_i$ 。Vova 想要雇佣其中一些战士，从而建立一支平衡的军队。如果对于任何一种类型，军队中这种类型的战士都不超过  $k$ ，那么这支军队就被称为平衡的。当然 Vova 想让这支军队的人数尽量多。

现在 Vova 有  $q$  个计划，第  $i$  个计划他只能雇佣区间  $[l_i, r_i]$  之间的战士。对于每个计划，你需要求出可以组建的平衡军队的最多人数。

本题强制在线，对于给定的  $l_i, r_i$ ，我们设上一个计划的答案为  $lastans$ （初始值为 0），实际的  $l_i, r_i$  通过如下方式生成：

1.  $l_i \leftarrow ((l_i + lastans) \bmod n) + 1$ 。
2.  $r_i \leftarrow ((r_i + lastans) \bmod n) + 1$ 。
3. 如果  $l_i > r_i$ ，交换  $l_i$  和  $r_i$ 。

数据范围：  $1 \leq n, k, q, a_i \leq 10^5$ 。

👤 Siyuan (<https://blog.orzsiyuan.com/author/1/>) © 2019 年 03 月 18 日

「Luogu 2617」 Dynamic Rankings (<https://blog.orzsiyuan.com/archives/Luogu-2617-Dynamic-Rankings/>)

题目链接：Luogu 2617 (<https://www.luogu.org/problemnew/show/P2617>)

给定一个含有  $n$  个数的序列  $a_i$ ，接下来有  $m$  个询问，询问分为以下 2 种：

- $Q\ i\ j\ k$ ：询问区间  $[i, j]$  排序后的第  $k$  个数。
- $C\ i\ t$ ：将  $a_i$  修改为  $t$ 。

数据范围：  $1 \leq n, m \leq 10^5, 0 \leq a_i \leq 10^9$ 。

1 (<https://blog.orzsiyuan.com/tag/Segment-Tree/1/>)

2 (<https://blog.orzsiyuan.com/tag/Segment-Tree/2/>)





➤ (<https://blog.orzsiyuan.com/tag/Segment-Tree/2/>)



热门文章

- (<https://blog.orzsiyuan.com/archives/ZJOI-2019/>) (<https://blog.orzsiyuan.com/archives/ZJOI-2019/>) 2019-  6051
- (<https://blog.orzsiyuan.com/archives/hehezhou-AK-CSP-2019/>) (<https://blog.orzsiyuan.com/archives/hehezhou-AK-CSP-2019/>) CSP-2019 算法模板复习 (hehezhou-AK-CSP-2019) AK-  2892
- (<https://blog.orzsiyuan.com/archives/Polynomial-Template/>) (<https://blog.orzsiyuan.com/archives/Polynomial-Template/>) 2019-  1080
- (<https://blog.orzsiyuan.com/archives/SDOI-2017-Number-Table/>) (<https://blog.orzsiyuan.com/archives/SDOI-2017-Number-Table/>) SDOI-2017 数字表格 (SDOI-2017-Number-Table) 2017-  1028
- (<https://blog.orzsiyuan.com/archives/TJOI-2019-Sing-Dance-Rap-and-Basketball/>) (<https://blog.orzsiyuan.com/archives/TJOI-2019-Sing-Dance-Rap-and-Basketball/>) TJOI-2019 唱歌跳舞和篮球 (TJOI-2019-Sing-Dance-Rap-and-Basketball) 2019-  843

博客信息

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 最后活动	4 个月前

标签云

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