$Na_1, a_2, \ldots, a_NQ$
$(l, r)k$
(l, r)
$N \leq$
$10^5Q \leq$
10^4
$O(Q_1 \log N \cdot$
$N +$
$Q_2 \log N)$
k
0
$kk \in$
$N \bigcap$
$\{0\}$
$N01Q$
$ab1$
$ab0$
$ab0110$
$ab1$
$N \leq$
$10^6Q \leq$
10^5
$Na_0, a_1, \cdots, a_{N-1}Q$
$inc(lf, rg, v)[lf, rg]v$
$rmq(lf, rg)[lf, rg]$
$1 \leq$
$N \leq$
$2000000 \leq$
$Q \leq$
$200000|v|, |a_i| \leq$
10^6
N
$N \leq$
$10^5x, y010^6$
NSQ
$[L, R]$
$[L, R]P$
$Q, N \leq$
$2^{15}S_i \leq$
$\min(N, 2^5)$
2^5
$131, 3, 6, 131', 3', 6', 13'$
$O(n)O(\log n)$
$O(\log n)$
$=$
$+O(\log N)O(\log N)$
$_key) :$
$key(_key), pri(rand())l = r = nullptr;;$
$1n$
$1n{=}1n$
$O(\log N)2 \log N \frac{1}{n^2}O(\log N)$
$a, b \;\; a \;\; \mathbf{key} \;\; b$
$<$
$ka>$
kb
$\equiv ++1$
k
$<$
k
1
$k{+}1 = \geq +1 < +1$
$[l, r)$
$[0, l)[l, r)[r, n)[l, r)$
$\log N$
$[l_1, r_1)[l_2, r_2)$
k
$[0, l_1)[l_1, r_1)[r_1, l_2)[l_2, r_2)[r_2, n)[0, l_1)[l_2, r_2)[r_1, l_2)[l_1, r_1)[r_2, n)$
$_a) :$
$a(_a), si(1), pri(rand())l = r = nullptr; voidpull()si = s(l) + s(r) + 1;; ints(node*$
$a)returna?a- > si : 0; node*$
$merg(node*$
$a, node*$
$b)if(!a)returnb; if(!b)returna; if(a- > pri < b- > pri)returna- > r = merg(a- > r, b), a- > pull(), a; elsereturnb- >$
$n, node*$
$a, intk, node*$
$b)if(!n)returna = b = nullptr, void(); if(k > s(n- > l) + 1)a = n; split(n- > r, a- > r, k - s(n- > l) - 1, b); a- > pull$
$n, intk)//0 - baseif(s(n- > l) + 1 == k)returnn- > a; if(s(n- > l) + 1 < k)returnk- = s(n- > l) + 1, query(n- > r$
$n, intl1, intr1, intl2, intr2)//0 - base, []node * a, *b, *c, *d, *e; split(n, a, l1, b); n = b; split(n, b, r1 - l1 + 1, c); n = c; split($
NMQ
121107122
$_base ::$
$sync_with_stdio(0); cin.tie(0); defineendl''usingnamespacestd;$
$_back(p); return; ins(2*$
$id+$
$1, l, (l+$
$r)/2, al, ar, p); ins(2*$