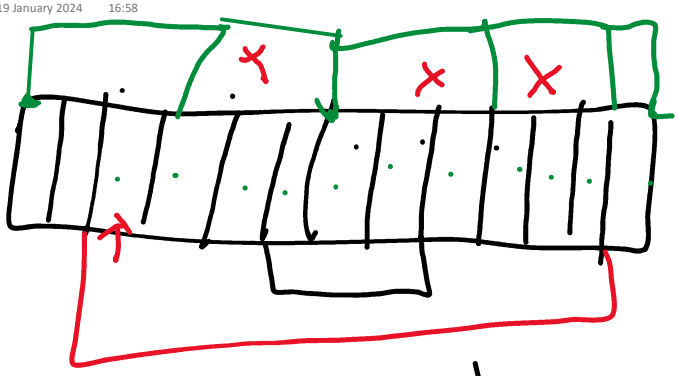
K11 - SQRT Decomposition

19 January 2024 16:58



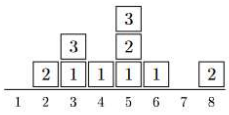
$\sqrt{n}$

$$O\left(x + \frac{n}{x}\right) = O\left(\sqrt{n} + \frac{n}{\sqrt{n}}\right) = O(\sqrt{n})$$

Przykład

Dla danych wejściowych:
8 3
3 4 1
2 3 3
3 2 2

poprawnym wynikiem jest:
0 1 2 1 3 1 0 1



Numer na każdym kontenerze odpowiada numerowi operacji, w której został on umieszczony na rampie.

$d_j > \sqrt{n} \Rightarrow b_i < \sqrt{n}$

brut

$d_i < \sqrt{n}$

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[a].pB(d, 1)
[a+((i-1)·d)].pB(d, -1)
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t[a[i]][pos % d[i]]+= change
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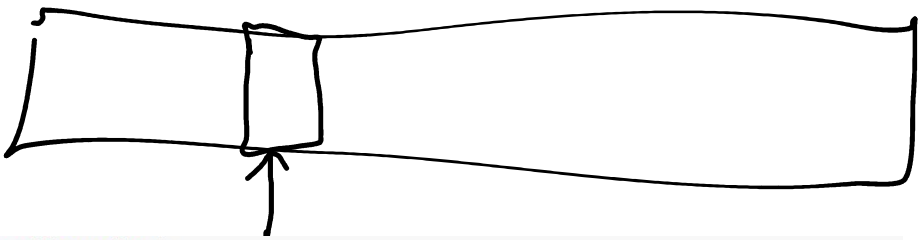
T[d][pos % d] += change

1 √n



```
26 void count(int x)
27 {
28     for(vector<pair<int, int> >::iterator it = changes[x].begin(); it != changes[x].end(); it++)
29         T[it->first][x % it->first] += it->second;
30     for(int i = 1; i <= Sqrt; i++) C[x] += T[i][x % i];
31 }
```

for i = 0 i < n count[i]

O(n√n + q)

C[i]