//Tur 1 zad A

#include <fstream>

using namespace std;

ifstream cin("equation.in");

ofstream cout("equation.out");

int main()

{

 int a, b, c;

 cin>>a>>b>>c;

 if(a+b==c)

 {

 cout<<a<<"+"<<b<<"="<<c;

 return 0;

 }

 if(a-b==c)

 {

 cout<<a<<"-"<<b<<"="<<c;

 return 0;

 }

 if(a\*b==c)

 {

 cout<<a<<"\*"<<b<<"="<<c;

 return 0;

 }

 if( b!=0 && a/b==c)

 {

 cout<<a<<"/"<<b<<"="<<c;

 return 0;

 }

 if(a==b+c)

 {

 cout<<a<<"="<<b<<"+"<<c;

 return 0;

 }

 if(a==b-c)

 {

 cout<<a<<"="<<b<<"-"<<c;

 return 0;

 }

 if(a==b\*c)

 {

 cout<<a<<"="<<b<<"\*"<<c;

 return 0;

 }

 if(c!=0 && a==b/c)

 {

 cout<<a<<"="<<b<<"/"<<c;

 return 0;

 }

 return 0;

}

Tur 1 zad b

#include <fstream>

#include <set>

using namespace std;

ifstream cin("boxes.in");

ofstream cout("boxes.out");

#define ll long long

multiset <ll> s;

int main()

{

 ll n, m, i, j, a, b, res = 0;

 cin>>n>>m;

 for(i = 0; i<m ;i++)

 {

 cin>>a;

 s.insert(a);

 }

 while(!s.empty()&& \*s.begin()<=n)

 {

 res++;

 n-= (\*s.begin());

 s.erase(s.begin());

 }

 cout<<res;

 return 0;

}

Tur 1 zad c

#include <fstream>

#include <set>

#include <algorithm>

#include <vector>

using namespace std;

ifstream cin("magic.in");

ofstream cout("magic.out");

#define ll long long

set<int> used;

vector <pair <pair<int, int> , int> > v;

int main()

{

 int n, l, r, i, j, a, b, k = 0;

 cin>>n;

 n++;

 for(i=0;i<n;i++)

 {

 cin>>l>>r;

 v.push\_back(make\_pair(make\_pair(l, 1), i+1));

 v.push\_back(make\_pair(make\_pair(r, 2), i+1));

 }

 sort(v.begin(), v.end());

 for(i = 0; i<v.size();i++)

 {

 if(v[i].first.second==1)

 {

 k++;

 used.insert(v[i].second);

 if(k==n-1)

 {

 a = 1;

 set<int>::iterator it = used.begin();

 while(it!=used.end() && \*it==a)

 {

 a++;

 it++;

 }

 cout<<a<<"\n";

 return 0;

 }

 }else

 {

 k--;

 used.erase(v[i].second);

 }

 }

}

Tur 1 zad d

#include <fstream>

#include <vector>

using namespace std;

ifstream cin("football.in");

ofstream cout("football.out");

//ofstream coutt("output.txt");

#define MAXN 1005

#define MAXM 1005

struct p

{

 int x;

 int y;

};

vector<pair<p, p> > vv;

long long dp[MAXN][MAXM];

int main()

{

 long long n, m, q, i, j, k, l;

 long long ress = 0;

 cin >> n >> m >> q;

 p a, b;

 for (i = 0; i < q; i++)

 {

 cin >> a.x >> a.y >> b.x >> b.y;

 vv.push\_back({ a, b });

 }

 for (i = 1; i <= n; i++)//st

 {

 for (j = 1; j <= m; j++)

 {

 dp[i][j] = 0;

 }

 }

 for (i = 0; i < q; i++)

 {

 dp[vv[i].first.x][vv[i].first.y]++;

 }

 for (i = 1; i <= n; i++)

 {

 for (j = 1; j <= m; j++)

 {

 dp[i][j] += dp[i - 1][j] + dp[i][j - 1] - dp[i - 1][j - 1];

 }

 }

 for (i = 0; i < q; i++)

 {

 ress += dp[vv[i].second.x][vv[i].second.y];

 }

 for (i = 1; i <= n; i++)//end

 {

 for (j = 1; j <= m; j++)

 {

 dp[i][j] = 0;

 }

 }

 for (i = 0; i < q; i++)

 {

 dp[vv[i].second.x][vv[i].second.y]++;

 }

 for (i = 1; i <= n; i++)

 {

 for (j = 1; j <= m; j++)

 {

 dp[i][j] += dp[i - 1][j] + dp[i][j - 1] - dp[i - 1][j - 1];

 }

 }

 for (i = 0; i < q; i++)

 {

 ress += (-1\*dp[vv[i].second.x][vv[i].first.y - 1] - dp[vv[i].first.x - 1][vv[i].second.y] + dp[vv[i].first.x - 1][vv[i].first.y - 1]);

 }

 for (i = 1; i <= n+1; i++)//hpref

 {

 for (j = 1; j <= m+1; j++)

 {

 dp[i][j] = 0;

 }

 }

 for (i = 0; i < q; i++)

 {

 dp[vv[i].second.x + 1][vv[i].second.y]++;

 dp[vv[i].second.x + 1][vv[i].first.y]--;

 }

 for (i = 1; i <= n+1; i++)

 {

 for (j = m+1; j >= 1; j--)

 {

 dp[i][j] += dp[i][j + 1];

 }

 }

 for (i = 1; i <= n+1; i++)

 {

 for (j = 1; j <= m+1; j++)

 {

 dp[i][j] += dp[i - 1][j];

 }

 }

 for (i = 0; i < q; i++)

 {

 ress += (-1\*dp[vv[i].first.x][vv[i].second.y + 1]);

 }

 for (i = 1; i <= n+1; i++)//vpref

 {

 for (j = 1; j <= m+1; j++)

 {

 dp[i][j] = 0;

 }

 }

 for (i = 0; i < q; i++)

 {

 dp[vv[i].second.x][vv[i].second.y + 1]++;

 dp[vv[i].first.x][vv[i].second.y + 1]--;

 }

 for (i = 1; i <= m+1; i++)

 {

 for (j = n+1; j >= 1; j--)

 {

 dp[j][i] += dp[j + 1][i];

 }

 }

 for (i = 1; i <= m+1; i++)

 {

 for (j = 1; j <= n+1; j++)

 {

 dp[j][i] += dp[j][i - 1];

 }

 }

 for (i = 0; i < q; i++)

 {

 ress += (-1\*dp[vv[i].second.x + 1][vv[i].first.y]);

 }

 ress -= q;

 ress /= 2;

 cout << ress;

 return 0;

}

Tur 1 zad e

#include <fstream>

#include <map>

#include <unordered\_map>

#include <vector>

using namespace std;

using namespace std;

typedef long long ll;

typedef unsigned long long ull;

typedef pair<int, int> pii;

typedef vector<int> vi;

typedef long double ld;

#define pb push\_back

const int arr = 2e5 + 10;

const int ar = 2e3 + 10;

const ll md = 1e9 + 7;

ifstream cin("radioactive.in");

ofstream cout("radioactive.out");

void add(int& a, int b)

{

 a += b;

 if (a>md) {

 a -= md;

 }

}

ll n, c;

int rem[ar];

int dp[ar][202];

unordered\_map<ll, int> remm;

int get(ll n)

{

 if (n<ar) {

 return rem[n];

 }

 if (remm.count(n)) {

 return remm[n];

 }

 vi pref\_sum(0);

 ll l = n / 2;

 vi vals(c + 1);

 for (int i = 0; i <= c; i++) {

 vals[i] = get(l - i - 1);

 pref\_sum.pb((pref\_sum.empty() ? 0 : pref\_sum.back()));

 add(pref\_sum.back(), vals[i]);

 }

 if (n % 2 == 1) {

 int ans = 0;

 /// set 1

 for (int i = 0; i <= c; i++) {

 add(ans, 1ll \* vals[i] \* pref\_sum[c - i - 1] % md);

 }

 /// set 0

 for (int i = 0; i <= c; i++) {

 add(ans, 1ll \* vals[i] \* pref\_sum[c] % md);

 }

 return remm[n] = ans;

 }

 else {

 int ans = 0;

 for (int i = 0; i <= c; i++) {

 add(ans, 1ll \* vals[i] \* pref\_sum[c - i] % md);

 }

 return remm[n] = ans;

 }

}

int main()

{

 cin >> n >> c;

 dp[0][0] = 1;

 for (int i = 0; i + 1<ar; i++) {

 for (int j = 0; j <= c; j++) {

 if (j != c) {

 add(dp[i + 1][j + 1], dp[i][j]);

 }

 add(dp[i + 1][0], dp[i][j]);

 }

 }

 for (int i = 0; i<ar; i++) {

 for (int j = 0; j <= c; j++) {

 add(rem[i], dp[i][j]);

 }

 }

 cout << get(n) << "\n";

}

Tur 2 zad A

#include <fstream>

#include <algorithm>

#include <string.h>

using namespace std;

int main()

{

ifstream cin("dog.in");

ofstream cout("dog.out");

long long a,b,c,d,l,m,p,l1=0,m1=0,p1=0,a1=0,c1=0,j;

cin>>a>>b>>c>>d>>l>>m>>p;

a1=a+b;

c1=c+d;

if(l%a1<=a && l%a1!=0)l1++;

if(l%c1<=c && l%c1!=0)l1++;

if(m%c1<=c && m%c1!=0)m1++;

if(m%a1<=a && m%a1!=0)m1++;

if(p%a1<=a && p%a1!=0)p1++;

if(p%c1<=c && p%c1!=0)p1++;

cout<<l1<<endl<<m1<<endl<<p1;

}

Tur 2 zad b

#include <fstream>

using namespace std;

ifstream cin("calculation.in");

ofstream cout("calculation.out");

int main()

{

 long long a, b, c, d, s;

 long long ai, bi, ci, di, ki, n, m, k, l, sum, ts;

 long long resa, resb, resc, resd, resk = 1000000ll\*100000ll;

 cin>>a>>b>>c>>d>>s;

 if(a\*5+b\*10+c\*20+d\*50<s || s%5!=0)

 {

 cout<<-1;

 return 0;

 }

 for(int i = 0; i<=d;i++)

 {

 ts = s;

 if(i\*50>ts)

 {

 di = ts/50;

 ts-=di\*50;

 }else

 {

 di = i;

 ts-=di\*50;

 }

 ci = min(c, ts/20);

 ts-=ci\*20;

 bi = min(b, ts/10);

 ts-=bi\*10;

 ai = min(a, ts/5);

 ts-=ai\*5;

 if(ts>0)

 {

 continue;

 }

 ki = ai+bi+ci+di;

 if(ki<resk)

 {

 resk = ki;

 resa = ai;

 resb = bi;

 resc = ci;

 resd = di;

 }

 }

 if(resk==1000000ll\*100000ll)

 {

 cout<<-1;

 }else {

 cout<<resa<<" "<<resb<<" "<<resc<<" "<<resd<<" "<<resk;

 }

 return 0;}

Tur 2 zad c

#include<fstream>

#include <math.h>

#include <string>

using namespace std;

ifstream cin("strings.in");

ofstream cout("strings.out");

long long dp[1000005];

string s;

long long inf[30][30];

long long infi[30][30];

int main()

{

 long long a, b, c, i, j, k, l;

 long long mini, maxi;

 cin>>a;

 cin>>s;

 for(i = 0; i<26;i++)

 {

 for(j = 0; j<26; j++)

 {

 infi[i][j] = -1;

 }

 }

 for(i = 0; i<26;i++)

 {

 infi[i][s[0] - 'a'] = 0;

 }

 if(1)

 {

 for(i = 1; i<a;i++)

 {

 long long best = 0;

 while(infi[best][best]==-1){best++;}

 for(j = best + 1; j<26;j++)

 {

 if(infi[s[i]-'a'][j]!=-1)

 {

 if(inf[s[i]-'a'][best]+(i - infi[s[i] - 'a'][best])\*abs((int)(s[i]-'a' - best)) < inf[s[i]-'a'][j]+(i - infi[s[i] - 'a'][j])\*abs((int)(s[i]-'a' - j)))

 {

 best = j;

 }

 }

 }

 dp[i] = inf[s[i]-'a'][best]+(i - infi[s[i] - 'a'][best])\*abs((int)(s[i]-'a' - best));

 for(j = 0; j<26;j++)

 {

 if(infi[j][s[i] - 'a']==-1)

 {

 inf[j][s[i] - 'a']= dp[i];

 infi[j][s[i] - 'a']= i;

 }else

 {

 if(dp[i]>inf[j][s[i] - 'a'] + (i - infi[j][s[i] - 'a'])\*abs((int)(s[i] - 'a' - j)) )

 {

 infi[j][s[i] - 'a']= i;

 inf[j][s[i] - 'a'] = dp[i];

 }

 }

 }

 }

 /\*for(i = 0; i<a;i++)

 {

 cout<<dp[i]<<" ";

 }\*/

 cout<<dp[a-1];

 }else

 {

 for(i = 1; i<a;i++)

 {

 for(j = 0; j<i; j++)

 {

 dp[i] = max(dp[i], dp[j] + (i-j)\*abs(s[i] - s[j]));

 }

 }

 for(i = 0; i<a;i++)

 {

 cout<<dp[i]<<" ";

 }

 //cout<<dp[i-1];

 }

}

/\*

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abccbaeedbaddbad

\*/

Tur 2 zad d

#include <fstream>

#include <vector>

using namespace std;

ifstream cin("robot.in");

ofstream cout("robot.out");

vector<int> v;

vector<int> vv;

vector<int> pos;

vector<int> dp;

int lb(int a, int l, int r)

{

 if (l == r)

 {

 return l;

 }

 else

 {

 int mid = (l + r) / 2;

 if (a <= dp[mid])

 {

 }

 else

 return lb(a, mid + 1, r);

 {

 return lb(a, l, mid);

 }

 }

}

int main()

{

 int n, k, i, j, a;

 cin >> n >> k;

 for (i = 0; i < n; i++)

 {

 cin >> a;

 vv.push\_back(a);

 }

 for (i = 0; i < k; i++)

 {

 if (i % 2 == 0)

 {

 for (j = 0; j < n; j++)

 {

 v.push\_back(vv[j]);

 }

 }

 else

 {

 for (j = n - 1; j >= 0; j--)

 {

 v.push\_back(vv[j]);

 }

 }

 }

 dp.push\_back(v[0]);

 pos.push\_back(0);

 for (i = 1; i < v.size(); i++)

 {

 if (v[i] <= dp[0])

 {

 dp[0] = v[i];

 pos.push\_back(0);

 }

 else if (v[i]>dp.back())

 {

 pos.push\_back(dp.size());

 dp.push\_back(v[i]);

 }

 else

 {

 int poss = lb(v[i], 0, dp.size() - 1);

 pos.push\_back(poss);

 dp[poss] = v[i];

 }

 }

 int result = dp.size();

 cout << result << "\n";

}

Tur 2 zad e

#include <fstream>

#include <algorithm>

#include <string>

using namespace std;

ifstream cin("lanterns.in");

ofstream cout("lanterns.out");

string s;

long long dat[300005];

long long res, n;

void getRes()

{

 long long tRes=0, i, tm=0;

 for (i = 0; i < n; i++)

 {

 tm = max(tm - 1, 0ll);

 if (tm < dat[i])

 {

 tRes += (dat[i] \* (dat[i] + 1)) / 2;

 tRes -= (tm \* (tm + 1)) / 2;

 tm = dat[i];

 }

 }

 res = max(res, tRes);

}

int main()

{

 long long q, i, j, a, b, c;

 cin >> n >> q;

 cin >> s;

 a = s[0]-'0';

 for (i = 1; i < n; i++)

 {

 if (s[i] == '0')

 {

 dat[i - a] = max(dat[i-a], a);

 a = 0;

 }

 else

 {

 a++;

 }

 }

 dat[i - a] = max(dat[i - a], a);

 getRes();

 cout << res<<"\n";

 for (j = 0; j < q; j++)

 {

 cin >> a >> b >> c;

 a--;

 b--;

 if (c == 0)

 {

 for (;a <= b;a++)

 {

 s[a] = '0';

 }

 cout << res<<"\n";

 }

 else

 {

 c = b - a + 1;

 i = b+1;

 while (i < n&&s[i] == '1')

 {

 i++;

 }

 c += i - b - 1;

 i = a - 1;

 while (i >= 0&&s[i] == '1')

 {

 i--;

 }

 c += a - i - 1;

 i++;

 dat[i] = max(dat[i], c);

 getRes();

 cout << res << "\n";

 for (; a <= b; a++)

 {

 s[a] = '1';

 }

 }

 }

}