MARYBMW – BMW -Sphere OJ

```
#include<bits/stdc++.h>
using namespace std;
#define long long int
const int N = 1e5+10;
int parent[N],sz[N];
bool ok[N];
vector<int>g[N];
void make(int i)
{
   parent[i] = i;
   sz[i] = 1;
}
int find(int v)
{
   if(parent[v] == v) return parent[v];
   return parent[v] = find(parent[v]);
}
void Union(int v1, int v2)
{
   v1 = find(v1);
   v2 = find(v2);
   if(v1 != v2)
   {
      if(sz[v1] < sz[v2])    swap(v1,v2);
```

```
        parent[v2] = v1;
        sz[v1] += sz[v2];
    }
}
vector<int> bfs(int src,int n)
{
    queue<int> Q;
    vector<int>vec;
    Q.push(src);
    ok[src] = true;
    while(!Q.empty())
    {
        int p = Q.front();
        Q.pop();
        ok[p] = true;
        vec.push_back(p);
        if(p == n) return vec;
        for(auto child:g[p])
        {
            if(ok[child] == false)
            {
                Q.push(child);
                ok[child] = true;
            }
        }
    }
```

```
    return vec;
}
int32_t main()
{
    ios_base::sync_with_stdio(false);
    cin.tie(NULL);
    int tt;
    cin >> tt;
    int n,m,ans=1e18+9,i,v1,v2,wt,k;
    vector<int>vec1;
    while(tt--)
    {
        cin >> n >> m;
        vector<pair<int,pair<int,int>>> graph,grap1;
        for(i=0; i<m; i++)
        {
            cin >> v1 >> v2 >> wt;
            graph.push_back({wt,{v1,v2}});
        }
        sort(graph.begin(),graph.end());
        reverse(graph.begin(),graph.end());
        for(i=1; i<=n; i++) make(i);
        for(auto it:graph)
        {
            wt = it.first;
            v1 = it.second.first;
```

```
    v2 = it.second.second;
    if(find(v1) == find(v2)) continue;
    Union(v1,v2);
    vec1.push_back(v1);
    vec1.push_back(v2);
    g[v1].push_back(v2);
    g[v2].push_back(v1);
    grap1.push_back({wt,{v1,v2}});
}
vector<int> vec;
vec = bfs(1,n);
sort(vec1.begin(),vec1.end());
vector<pair<int,int>> pr;
k=vec.size()-1;
if(vec1[vec1.size()-1] != n || vec1[0] != 1) cout <<-1 << '\n';
else
{
    for(i=0; i<k; i++)
    {
        pr.push_back({vec[i],vec[i+1]});
    }
    for(auto it:grap1)
    {
        int wt = it.first;
        int v1 = it.second.first;
        int v2 = it.second.second;
```

```
            for(auto it:pr)
            {
               if(it.first==v1 && it.second==v2)
               {
                  ans = min(ans,wt);
                  break;
               }
               else if(it.first==v2 && it.second==v1)
               {
                  ans = min(ans,wt);
                  break;
               }
            }
         }
         cout << ans << '\n';
      }
   }
}
```

(D) Shichikuji and Power Grid -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define int long long
const int N = 1e5+10;
int parent[N],sz[N];
void make(int i){
   parent[i] = i;
   sz[i] = 1;
}
int find(int v){
   if(parent[v] == v) return parent[v];
   return parent[v] = find(parent[v]);
}
void Union(int v1,int v2){
   v1 = find(v1);
   v2 = find(v2);
   if(v1 != v2){
      if(sz[v1]<sz[v2])   swap(v1,v2);
      parent[v2] = v1;
      sz[v1]+=sz[v2];
   }
}
int32_t main(){
   int n; cin >> n;
```

```
    vector<pair<int,int>> cities(n+1);
    for(int i=1;i<=n;i++){
        cin >> cities[i].first >> cities[i].second;
    }
    vector<int> c(n+1) , k(n+1);
    for(int i=1;i<=n;i++) cin >> c[i];
    for(int i=1;i<=n;i++) cin >> k[i];

    vector<pair<int,pair<int,int>>> graph;
    for(int i=1;i<=n;i++){
        graph.push_back({c[i],{0,i}});
    }
    for(int i=1;i<=n;i++){
        for(int j=i+1;j<=n;j++){
            int dist = abs(cities[i].first- cities[j].first) + abs(cities[i].second-
cities[j].second);
            int cost = dist * (k[i]+k[j]);
            graph.push_back({cost,{i,j}});
        }
    }
    sort(graph.begin(),graph.end());

    for(int i=1;i<=n;i++) make(i);
    int total_cost = 0;
    vector<int> power;
    vector<pair<int,int>> connection;
```

```
    for(auto it:graph){
        int wt = it.first;
        int v1 = it.second.first;
        int v2 = it.second.second;
        if(find(v1) == find(v2)) continue;
        Union(v1,v2);
        total_cost += wt;
        if(v1==0 || v2==0){
            power.push_back(max(v1,v2));
        }
        else{
            connection.push_back({v1,v2});
        }
    }
    cout << total_cost << endl;
    cout<< power.size() << endl;
    for(auto it:power){
        cout << it << " ";
    }
    cout << endl;
    cout << connection.size() << endl;
    for(auto it:connection){
        cout << it.first << " " << it.second << endl;
    }
}
```

(D) Valid BFS? – Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define int long long
const int N = 1e6+10;
vector<int>graph[N];
bool ok1[N],ok[N];
vector<int> bfs(int src){
	queue<int> Q;
	vector<int>pa;
	Q.push(src);
	pa.push_back(0);
	ok[src] = true;
	while(!Q.empty()){
		int data = Q.front();
		Q.pop();
		ok[data] = true;
		for(auto child:graph[data]){
			if(ok[child]==false){
				Q.push(child);
				pa.push_back(data);
				ok[child] = true;
			}

		}
	}
	return pa;
}
int32_t main(){
	int n;  cin >> n;
	for(int i=0;i<n-1;i++){
		int v1,v2;	cin >> v1 >> v2;
		graph[v1].push_back(v2);
		graph[v2].push_back(v1);
	}
```

```
vector<int>vec(n),vec2,vec1;
map<int,int>parent;
for(int i=0;i<n;i++){
	cin >> vec[i];
	if(i==0){
		vec1.push_back(vec[0]);
		ok1[vec[0]] = true;
	}
	for(auto child:graph[vec[0]]){
		if(vec[i]==child && ok1[child] == false){
			vec1.push_back(vec[i]);
			ok1[child] = true;
		}
	}
}
for(int i=1;i<n;i++){
	for(auto child:graph[vec[i]]){
		if(ok1[child] == false){
			vec1.push_back(child);
			ok1[child] = true;
		}
	}
}
if(vec == vec1) cout << "YES\n";
else{
	parent[vec[0]] = 0;
	ok1[vec[0]] = true;
	for(int i=1;i<=n;i++){
		for(auto it:graph[i]){
			for(int j=1;j<n;j++){
				if(vec[j]==it && ok1[it] == false){
					parent[vec[j]] = i;
					ok1[it] = true;
				}
			}
		}
```

```
            }
            vector<int>PA;
            for(int i=0;i<n;i++)  PA.push_back(parent[vec[i]]);
            vec2 = bfs(1);
            if(vec2 == PA) cout << "YES\n";
            else    cout << "NO\n";
        }

}
```

(D) Epic Transformation -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int32_t main(){
        int tt;  cin >> tt;
        while(tt--){
                int n;  cin >> n;
                vector<int>vec(n);
                map<int,int>mp;
                for(int i=0;i<n;i++){
                        cin >> vec[i];
                        mp[vec[i]]++;
                }
                int mx=-1;
                for(auto it:mp){
                        mx = max(mx,it.second);
                }
                int k = n-mx;
                if(mx <= k && n%2==0) cout << 0 << endl;
                else if(mx<=k && n%2!=0) cout << 1 << endl;
                else if(mx>k){
                        cout << mx-k << endl;
```

```
            }
        }
}
```

(B) Binary Cafe -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int32_t main(){
        int tt;  cin >> tt;
        while(tt--){
                int n,k;        cin >> n >> k;
                k = min(k,30);
                int ans = pow(2,k);
                ans = min(n+1,ans);
                cout << ans << endl;
        }
}
```

(A) Lala Land and Apple Trees -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
map<int,int>mp;
int32_t main(){
        int tt;  cin >> tt;
        int n=tt;
        int idx,value;
        int N=0,P=0;
        while(tt--){
```

```
        cin >> idx >> value;
        if(idx<0) N = min(N,idx);
        else P = max(P,idx);
        mp[idx] = value;
}
int neg=-1,pos=1;
int sum1=mp[0],sum2=mp[0];
for(int i=1;i<=n;i++){
        if(i%2==0){
                while(mp[neg]==0){
                        neg--;
                        if(neg<N) break;
                }
 if(neg<N) break;
                sum1+=mp[neg];
                neg--;
        }
        if(i%2!=0) {
                while(mp[pos]==0){
                        pos++;
                        if(pos>P) break;
                }
 if(pos>P) break;
                sum1+=mp[pos];
                pos++;
        }
}
neg=-1,pos=1;
for(int i=0;i<=n;i++){
        if(i%2==0){
                while(mp[neg]==0){
                        neg--;
   if(neg<N) break;
                }
 if(neg<N) break;
                sum2+=mp[neg];
                neg--;
```

```
            }
            if(i%2!=0) {
                while(mp[pos]==0){
                    pos++;
       if(pos>P) break;
                }
     if(pos>P) break;
                sum2+=mp[pos];
                pos++;
            }
        }
        cout << max(sum1,sum2) << endl;
}
```

(A) The Man who became a God -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int32_t main(){
    int tt;  cin >> tt;
    while(tt--){
        int n,m;    cin >> n >> m;
        vector<int>vec(n),vec1;
        for(int i=0;i<n;i++) cin >> vec[i];
        int sum=0;
        for(int i=0;i<n-1;i++){
            vec1.push_back(abs(vec[i]-vec[i+1]));
        }
        sort(vec1.begin(),vec1.end());
        for(int i=0;i<n-m;i++){
            sum+=vec1[i];
        }
        cout << sum << endl;
    }
```

(C) Sum in Binary Tree -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define int long long
int32_t main(){
   int tt; cin >> tt;
   while(tt--){
     int n; cin >> n;
     int sum = n;
     while(n!=1){
       sum +=n/2;
       n=n/2;
     }
     cout << sum << endl;
   }
}
```

(B) Long Long -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define int long long
int32_t main(){
        ios_base::sync_with_stdio(0);
        cin.tie(0);
        int tt;  cin >> tt;
        while(tt--){
                int n;  cin >> n;
                vector<int>vec(n);
                int operation = 0,sum = 0;
                int pos=0,neg=0,idx1,idx2;
                for(int i=0;i<n;i++){
```

```
                cin >> vec[i];
                sum += abs(vec[i]);
                if(vec[i]<0){
                        neg++;
                }
                if(vec[i]>0 && neg!=0){
                        neg=0;
                        operation++;
                }
        }
        if(neg!=0) operation++;
        cout << sum << " " << operation << endl;
    }
}
```

(A) Destroyer -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int32_t main(){
   ios_base::sync_with_stdio(0);
   cin.tie(0);
   int tt; cin >> tt;
   while(tt--){
      int n;  cin >> n;
      vector<int>vec(n),vec1,vec2;
      map<int,int>mp;
      int maxi =-1;
      for(int i = 0; i < n; i++){
         cin >> vec[i];
         maxi=max(maxi,vec[i]);
         mp[vec[i]]++;
      }
      bool ok = true;
      for(int i=0;i<maxi;i++){
```

```
            if(mp[i]<mp[i+1]){
                ok=false;
                break;
            }
        }
        if(!ok) cout << "NO" << endl;
        else cout << "YES" << endl;
    }
}
```

(C) Game with Reversing -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int32_t main(){
    ios_base::sync_with_stdio(0);
    cin.tie(0);
    int tt; cin >> tt;
    while(tt--){
        int n;  cin >> n;
        string str1,str2; cin >> str1 >> str2;
        string rev = str2;
        int cunt = 0;
        if(str1!=str2){
            reverse(rev.begin(), rev.end());
            int pre=0,next=0;
            for(int i=0;i<n;i++){
                if(str1[i]!=str2[i]) pre++;
            }
            for(int i=0;i<n;i++){
                if(str1[i]!=rev[i]) next++;
            }
            cunt = pre*2;
            if(pre%2!=0) cunt--;
```

```
            if(next==0) cunt = min(cunt,2);
            else if(next%2==0) cunt = min(cunt,2*next-1);
            else cunt = min(cunt,2*next);
        }
        cout << cunt << endl;
    }
}
```

(A) Little Elephant and Rozdil -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int32_t main(){
    ios_base::sync_with_stdio(0);
    cin.tie(0);
    int n;  cin >> n;
    vector<int>vec(n),vec1(n);
    for(int i = 0; i < n; i++) cin >> vec[i];
    vec1 = vec;
    sort(vec.begin(), vec.end());
    bool ok=false;
if(n==1){
     cout << 1 <<endl;
    return 0;
}
    for(int i = 1; i < n; i++){
        if(vec[0]==vec[1]){
            cout <<"Still Rozdil"<< endl;
            ok = true;
            break;
        }
    }
    if(!ok){
        for(int i=0;i<n;i++){
```

```
            if(vec1[i] == vec[0]){
                cout << i+1 << endl;
            }
        }
    }
}
```

(C) Very Easy Task -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
const int MAX = 2e9;
int n,x,y;
bool ok(int t){
    if(x>y) swap(x,y);
    ll p=0;
    if(x <= t){
        p=1;
        t-=x;
        p += floor(t/x);
        p += floor(t/y);
    }
    return p>=n;
}
int32_t main(){
    ios_base::sync_with_stdio(0);
    cin.tie(0);
    cin >> n >> x >> y;
    int l=1,r=MAX,time=0;
    while(l<=r){
        int mid = l+(r-l)/2;
        // cout << mid << endl;
        if(ok(mid)){
            time = mid;
```

```
        r=mid-1;
      }
      else{
        l=mid+1;
      }
   }
   cout << time << endl;
}
```

(B) Ropes -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define int long long
int n,k;
vector<int>vec;
bool ok(double length){
   int cunt = 0;
   for(int i=0;i<n;i++){
      cunt+=floor(vec[i]/length);
   }
   return cunt>=k;
}
int32_t main(){
   ios_base::sync_with_stdio(0);
   cin.tie(0);
   cin >> n >> k;
   for(int i = 0; i<n;i++){
      int x; cin >> x;
      vec.push_back(x);
   }
   double l=0,r=1e7+9,ans = 0;
```

```
    while(r-l > 1e-7){
        double mid = (l+r)/2;
        if(ok(mid)){
            ans = mid;
            l = mid;
        }
        else{
            r=mid;
        }
    }
    cout <<fixed << setprecision(10)<< ans << endl;
}
```

(D) Fast search -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
    ios_base::sync_with_stdio(true);
    cin.tie(0);
    ll n;   cin >> n;
    vector<ll> vec(n),vec1;
    for(int i = 0; i < n;i++) cin >> vec[i];
    ll k; cin >> k;
    sort(vec.begin(), vec.end());
    for(int i = 0; i < k;i++){
        ll l,r; cin >> l >> r;
```

```
        auto it = lower_bound(vec.begin(),vec.end(),l);
        auto it2 = upper_bound(vec.begin(),vec.end(),r);
        vec1.push_back((it2-vec.begin())-(it-vec.begin()));
    }
    for(auto it:vec1) cout << it << " ";
    cout << endl;
}
```

(C) Closest to the Right -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    ios_base::sync_with_stdio(true);
    cin.tie(0);
    int n,k; cin >> n >> k;
    vector<int>vec(n);
    for(int i = 0; i < n;i++) cin >> vec[i];
    for(int i=0;i<k;i++){
        int x;  cin >> x;
        auto it = lower_bound(vec.begin(), vec.end(),x);
        cout << (it-vec.begin())+1 << endl;
    }
}
```

(A) Binary Search -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
   ios_base::sync_with_stdio(0);
   cin.tie(0);
   int n,k;    cin >> n >> k;
   vector<int>vec;
   for(int i = 0; i<n;i++){
      int x;  cin >> x;
      vec.push_back(x);
   }
   for(int i = 0;i<k;i++){
      int x;  cin >> x;
      int low=0,high=n-1;
      bool ok=false;
      while(low<=high){
         int mid=(low+high)/2;
         if(vec[mid]==x){
            cout << "YES\n";
            ok=true;
            break;
         }
         if(x>=vec[mid]){
```

```
            low=mid+1;
        }
        else if(x<=vec[mid]){
            high=mid-1;
        }
    }
    if(ok==false){
        cout << "NO\n";
    }
  }
}
```

(B) Maximum Sum -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
  ll tt;  cin >> tt;
  while(tt--){
    ll n,k; cin >> n >> k;
    vector<ll> vec;
    ll sum = 0;
    for(ll i=0; i<n;i++){
```

```
        ll x;   cin >> x;
        vec.push_back(x);
        sum += x;
    }
    sort(vec.begin(),vec.end());
    vector<ll>first(n+10,0),last(n+10,0);
    first[0]=0;
    for(ll i=1;i<=n;i++){
        first[i] = first[i-1]+vec[i-1];
    }
    reverse(vec.begin(),vec.end());
    last[0] = 0;
    for(ll i=1;i<=n;i++){
        last[i] = last[i-1] + vec[i-1];
    }
    ll ans =0 ;
    for(ll i=0;i<=k;i++){
        ll start = first[2*i];
        ll end =last[k-i];
        ans = max(ans,sum-(start+end));
    }
    cout << ans << endl;
  }
}
```

(A) New Palindrome -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
   ll tt;  cin >> tt;
   while(tt--){
      string str; cin >> str;
      sort(str.begin(), str.end());
      map<char,ll>mp;
      for(ll i = 0; i < str.size(); i++){
         mp[str[i]]++;
      }
      ll cunt = 0,k=0;
      if(mp.size()>2){
         cunt++;
      }
      else if(mp.size()==2){
         for(auto it:mp){
            if(it.second>=2) k++;
         }
      }
      if(k>=2) cunt++;
      if(cunt>=1) cout << "YES" << '\n';
```

```
    else cout << "NO" << '\n';
  }
}
```

Balanced Brackets -HackerRank

```
#include<bits/stdc++.h>
using namespace std;
int32_t main(){
        int tt;  cin >> tt;
        while(tt--){
                string str;     cin >> str;
                bool ok = true;
                int len=str.size();
                stack<int>st1,st2,st3;
                for(int i=0;i<len;i++){
                        if(str[i]=='(') st1.push(i);
                        else if(str[i] == ')' && st1.size()!=0){
                                int p = st1.top();
                                st1.pop();
                                if(p%2 == i%2){
                                        ok=false;
                                        break;
                                }
                        }
```

```
        else if(str[i]=='{') st2.push(i);
        else if(str[i] == '}'&& st2.size()!=0){
                int p = st2.top();
                st2.pop();
                if(p%2 == i%2){
                        ok=false;
                        break;
                }
        }

        else if(str[i]=='[') st3.push(i);
        else if(str[i] == ']' && st3.size()!=0){
                int p = st3.top();
                st3.pop();
                if(p%2 == i%2){
                        ok=false;
                        break;
                }
        }

        else if( (st1.size()==0 && str[i]==')') || (st2.size()==0 &&
str[i]=='}') || (st3.size()==0 && str[i]==']') ){
                        ok = false;
                        break;
        }
```

```
            }
            if(ok && len%2==0 && st1.size()==0 && st2.size()==0 && st3.size()==0)
cout << "YES" << endl;
            else cout << "NO" << endl;
        }
}
```

Babelfish -UVA-10282

```
#include<bits/stdc++.h>
using namespace std;
int32_t main(){
    string line;
    map<string,string>mp;
    while(getline(cin,line)){
        if(line.size()==0) continue;
        if(find(line.begin(),line.end(),' ')!=line.end()){
            stringstream ss(line);
            string str1,str2;
            ss>>str1;
            ss>>str2;
            mp[str2] = str1;
        }
        else{
            if(mp.find(line)!=mp.end()) cout << mp[line] << endl;
```

```
                else cout << "eh" << endl;
            }
        }
}
```

The Department of Redundancy Department -UVA-484

```
#include<bits/stdc++.h>
using namespace std;
int32_t main(){
    ios_base::sync_with_stdio(0);
    cin.tie(0);
    string str;
    map<string,int>mp;
    vector<string>vec;
    while(cin >> str && str!="\n"){
        if(mp[str] == 0) vec.push_back(str);
        mp[str]++;
    }
    for(int i=0;i<vec.size();i++){
        cout << vec[i] << " " << mp[vec[i]] << endl;
    }
}
```

Maps-HackerRank

```
#include<bits/stdc++.h>
using namespace std;
int main(){
	ios_base::sync_with_stdio(0);
	cin.tie(0);
	int tt;  cin >> tt;
	map<string, int> mp;
	map<string, int> ::iterator it;
	while(tt--){
		int x;   cin >> x;
		string name;
		int mark = 0;
		if(x == 1){
			cin >> name;
			cin >> mark;
			mp[name] += mark;
		}
		else if(x == 2){
			cin >> name;
			mp.erase(name);
		}
		else if(x == 3){
			cin >> name;
			cout << mp[name] << '\n';
```

```
            }
        }
}
```

Number of Islands -LeetCode

```
class Solution {
public:
    void dfs(int i,int j,vector<vector<char>>& grid){
        int n = grid.size();
        int m = grid[0].size();
        if(i<0 || j<0) return;
        if(i>=n || j>=m || grid[i][j]=='0' || grid[i][j]=='2') return;
        if(grid[i][j]=='1'){
            grid[i][j]='2';
            dfs(i+1,j,grid);
            dfs(i-1,j,grid);
            dfs(i,j+1,grid);
            dfs(i,j-1,grid);
        }
    }
    int numIslands(vector<vector<char>>& grid) {
        int n = grid.size();
        int m = grid[0].size();
        int cunt=0;
```

```
        for(int i=0;i<n;i++){
            for(int j=0;j<m;j++){
                if(grid[i][j]=='0' || grid[i][j]=='2') continue;
                if(grid[i][j]=='1'){
                    grid[i][j] = '2';
                    dfs(i+1,j,grid);
                    dfs(i-1,j,grid);
                    dfs(i,j+1,grid);
                    dfs(i,j-1,grid);
                    cunt++;
                }
            }
        }
        return cunt;
    }
};
```

Flood Fill -LeetCode

```
class Solution {
public:
   void dfs(int i,int j, int initialColor,int newColor,vector<vector<int>>& image){
      int n=image.size();
      int m=image[0].size();
      if(i<0 || j<0) return;
      if(i>=n || j>=m) return;
      if(image[i][j] != initialColor) return;
      image[i][j] = newColor;

      dfs(i-1,j,initialColor,newColor,image);
      dfs(i+1,j,initialColor,newColor,image);
      dfs(i,j-1,initialColor,newColor,image);
      dfs(i,j+1,initialColor,newColor,image);
   }
   vector<vector<int>> floodFill(vector<vector<int>>& image, int sr, int sc, int
newColor) {
      int initialColor = image[sr][sc];
      if(initialColor != newColor)
         dfs(sr,sc,initialColor,newColor,image);
      return image;
   }
};
```

Update to Palindrome -CodePanja

```
#include <bits/stdc++.h>
using namespace std;
#define nl '\n'
typedef long long int ll;
#define vl vector<ll>
#define For(i, n) for (ll i = 0; i < n; i++)
int main(){
   ll n;
   cin >> n;
   vl vec;
   For(i, n)
   {
      ll x;
      cin >> x;
      vec.pb(x);
   }
   ll cunt = 0;
   for (ll i = 0, j = n- 1; i <= j;)
   {
      if (vec[i] == vec[j])
         i++, j--;
      else if (vec[i] > vec[j])
      {
```

```
            j--;
            vec[j] += vec[j + 1];
            cunt++;
        }
        else
        {
            i++;
            vec[i] += vec[i- 1];
            cunt++;
        }
    }
    cout << "S #" << k++ << ": " << cunt << nl << nl;
}
```

(C) Mr. Perfectly Fine -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
    ll tt;  cin >> tt;
    while(tt--){
        ll n;   cin >> n;
```

```
vector<pair<int,int>> vec;
vector<ll>one,ten,eleven;
for(ll i=0;i<n;i++){
   int x,y; cin >> x >> y;
   vec.push_back({x,y});
   if(y==01) one.push_back(x);
   else if(y==10) ten.push_back(x);
   else if(y==11) eleven.push_back(x);
}
sort(vec.begin(),vec.end());
sort(one.begin(),one.end());
sort(ten.begin(),ten.end());
sort(eleven.begin(),eleven.end());
ll ans=0,cunt1=0,cunt2=0;
for(ll i=0;i<n;i++){
   if(one.size()==0 && eleven.size()==0) ans = 0;
   else if(ten.size()==0 && eleven.size()==0) ans = 0;
   if(one.size()!=0 && ten.size()!=0){
      cunt1 = one[0]+ten[0];
   }
   if(eleven.size()!=0){
      cunt2=eleven[0];
   }
   else ans = cunt1;
}
if(cunt1!=0 && cunt2!=0) ans = min(cunt1,cunt2);
```

```
        else if(cunt2!=0) ans = cunt2;
        if(ans ==0) ans =-1;
        cout << ans << endl;
    }
}
```

(B) JoJo's Incredible Adventures -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
    ll tt;  cin >> tt;
    while(tt--){
        string str; cin >> str;
        ll one = 0,n=str.size();
        for(ll i=0;i<n;){
            ll cunt = 0;
            if(str[i]=='1'){
                while(i<n && str[i]=='1'){
                    cunt++; i++;
                }
                one = max(one,cunt);
            }
```

```
    else{
        i++;
    }
}
ll cunt = 0;
for(ll i=0;i<n;i++){
    if(str[i]=='0') break;
    cunt++;
}

for(ll i=n-1;i>=0;i--){
    if(str[i]=='0') break;
    cunt++;
}

cunt = min(cunt,n);
one = max(one,cunt);
if(one == n){
    cout << one*one << endl;
}
else{
    one++;
    ll l = one/2;
    ll b = one-l;
    cout << l*b << endl;
}
```

```
    }
}
```

(B) Grid Reconstruction -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
    ll tt; cin >> tt;
    while(tt--){
        ll n;   cin >> n;
        ll arr[2][n];
        arr[0][0] = 2*n;
        arr[1][n-1] = 2*n-1;
        ll start = 1,end = 2*n-2;
        for(ll i=0;i<n-1;i++){
            if(i%2!=0){
                arr[1][i]=end-1;
                arr[0][i+1] = end;
                end= end-2;
            }
            else{
                arr[1][i] = start;
```

```
            arr[0][i+1] = start+1;
            start= start+2;
        }
    }
    for(ll i=0;i<2;i++){
        for(ll j=0;j<n;j++){
            cout << arr[i][j] << " ";
        }
        cout << endl;
    }
  }
}
```

(B) Li Hua and Pattern -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
  ll tt;  cin >> tt;
  while(tt--){
    ll n,k;  cin >> n>>k;
    ll arr[n][n];
```

```
for(ll i=0;i<n;i++){
    for(ll j=0;j<n;j++){
        cin >> arr[i][j];
    }
}
if(n==1){
    cout << "YES" << endl;
    continue;
}
ll cunt = 0;
for(ll i=0; i<n/2;i++){
    for(ll j=0;j<n;j++){
        if(arr[i][j] != arr[n-1-i][n-1-j]) cunt++;
    }
}
if((n&1) !=0){
    for(ll i=0;i<n/2;i++){
        if(arr[n/2][i] != arr[n/2][n-1-i]) cunt++;
    }
}
if(cunt>k) cout << "NO" << endl;
else{
    k=k-cunt;
    if(k%2==0 || (n&1)!=0){
        cout << "YES" << endl;
    }
```

```
        else cout << "NO" << endl;
      }
   }
}
```

(C) Place for a Selfie -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
   ll tt;  cin>>tt;
   while(tt--){
      ll n,m;  cin>>n>>m;
      vector<ll> vec(n);
      for(ll i=0;i<n;i++) cin >> vec[i];
      sort(vec.begin(),vec.end());
      while(m--){
         ll a,b,c;  cin>>a>>b>>c;
         if(c<=0){
            cout<<"NO"<<'\n';
            continue;
         }
```

```
        ll idx = lower_bound(vec.begin(),vec.end(),b)-vec.begin();
        if(n!=idx){
           ll w = abs(b-vec[idx]);
           w = w*w;
           if(4*a*c>w){
              cout<<"YES"<<'\n';
              cout<<vec[idx]<<'\n';
              continue;
           }
        }

        if(0!=idx){
           idx = idx-1;
           ll w = abs(b- vec[idx]);
           w=w*w;
           if(4*a*c>w){
              cout<<"YES"<<'\n';
              cout<<vec[idx]<<'\n';
              continue;
           }
        }
        cout<<"NO"<<'\n';
     }
   }
}
```

(B) Candies -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
   ll tt;  cin >> tt;
   while(tt--){
      ll n;   cin >> n;
      vector<ll> vec;
      if(n%2 == 0) cout <<-1 << '\n';
      else{
         vec.push_back(n);
         while(n!=3){
            if(n==1) break;
            ll f = (n-1)/2;
            ll s = (n+1)/2;
            if(f%2!=0){
               vec.push_back(f);
               n = f;
            }
            else if(s%2!=0){
               vec.push_back(s);
               n = s;
            }
```

```
        }
        sort(vec.begin(), vec.end());
        if(vec.size()>40) cout <<-1 << '\n';
        else cout << vec.size() << '\n';
        ll p=1;
        for(ll i=0;i<vec.size();i++){
           if(((2*p)-1) == vec[i]){
              cout << 1 << " ";
              p = (2*p)-1;
           }
           else if(((2*p)+1) == vec[i]){
              cout << 2 << " ";
              p = (2*p)+1;
           }
        }
        cout << endl;
     }
  }
}
```

(B) Three Sevens -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
   ll tt;   cin >> tt;
   while(tt--){
      ll d;   cin >> d;
      vector<vector<ll>>vec(d);
      for(ll i=0;i<d;i++){
         ll n;   cin >> n;
         for(ll j=0;j<n;j++){
            ll x;   cin >> x;
            vec[i].push_back(x);
         }
      }
      vector<ll>ans(d);
      set<ll> s;
      for(ll i=d-1;i>=0;i--){
         ll p=0;
         if(i==d-1){
            sort(vec[i].begin(),vec[i].end());
            for(ll j=0;j<vec[i].size();j++) s.insert(vec[i][j]);
            ans.push_back(vec[i][0]);
```

```
    }
    else{
        set<ll>::iterator it;
        sort(vec[i].begin(),vec[i].end());
        for(ll j=0;j<vec[i].size();j++){
            it = s.find(vec[i][j]);
            if(it != s.end()) s.insert(vec[i][j]);
            else if(p==0){
                ans.push_back(vec[i][j]);
                s.insert(vec[i][j]);
                p++;
            }
            else s.insert(vec[i][j]);
        }
    }
}
ll cunt = 0;
for(ll i=ans.size()-1;i>=0;i--){
    if(ans[i]!=0){
        cunt++;
    }
}
if(cunt != d) cout <<-1;
else{
    for(ll i=ans.size()-1;i>=0;i--){
    if(ans[i]!=0){
```

```
            cout << ans[i] << " ";
          }
        }
        }
        cout << endl;
    }
}
```

(C) Rock and Lever -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    long long tt,i,j,cunt,n; cin >> tt;
    while(tt--){
        cin >> n;
        vector<long long>vec(n);
        for(i=0; i<n; i++) cin >> vec[i];
        cunt = 0;
        vector<long long> vec1;
        for(i=0; i<n; i++) {
            bitset<32>b(vec[i]);
            for(j=b.size()-1; j>=0;j--){
```

```
            if(b[j] == 1){
                vec1.push_back(j);
                break;
            }
        }
    }
    map<long long,long long>mp;
    for(auto it:vec1){
        mp[it]++;
    }
    for(auto it:mp){
        // cout << it.first << " " << it.second << endl;
        if(it.second>=2) cunt = cunt + (it.second*(it.second-1)/2);
    }
    cout << cunt << '\n';
  }
}
```

(B) Count the Number of Pairs -Codeforces

```
#include <bits/stdc++.h>
using namespace std;
int main(){
  int tt;
```

```
cin >> tt;
while (tt--){
    int n, k;
    cin >> n >> k;
    string str;  cin >> str;
    map<pair<char, char>, pair<int, int>> mp;
    for (int i = 0; i < n; i++){
        if (str[i] >= 'a' && str[i] <= 'z'){
            mp[{str[i], str[i]- 'a' + 'A'}].first++;
        }
        else{
            mp[{str[i]- 'A' + 'a', str[i]}].second++;
        }
    }
    int ans = 0;
    for (auto it : mp){
        int l = min(it.second.first, it.second.second);
        ans += l;
        it.second.first-= l;
        it.second.second-= l;
        int p = max(it.second.first, it.second.second);
        int mini = min(p / 2, k);
        ans += mini;
        k-= mini;
    }
    cout << ans << endl;
```

```
    }
}
```

(B) Equalize by Divide -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    int tt,n; cin >> tt;
    while(tt--){
        cin >> n;
        int arr[n];
        for(int i=0;i<n;i++)    cin >> arr[i];
        int cunt = 0;
        double x;
        vector<pair<int,int>> vec;
        for(int j=0;j<30*n;j++){
        for(int i=0;i<n-1;i++){
            if(arr[i]!=arr[i+1]){
                if(arr[i]>arr[i+1]){
                    x = ((double)arr[i]/(double)arr[i+1]);
                    arr[i] = ceil(x);
                    vec.push_back(make_pair(i+1,i+2));
                }
```

```
            else{
                x = ((double)arr[i+1]/(double)arr[i]);
                arr[i+1] = ceil(x);
                vec.push_back(make_pair(i+2,i+1));
            }
            cunt++;

        }
    }
    }
    sort(arr,arr+n);
    if(arr[0]==arr[n-1] && cunt == 0) cout << 0 << endl;
    else if(arr[0]!=arr[n-1]) cout <<-1 << endl;
    else if(arr[0] == arr[n-1]){
        cout << cunt << endl;
        for(auto it:vec){
            cout << it.first << " " << it.second << endl;
        }
    }
}
```

(A) Recent Actions -Codeforces

```
#include <bits/stdc++.h>
using namespace std;
int main() {
   int tt;        cin >> tt;
          int n,m;
          while(tt--){
                    cin >> n >> m;
                    int arr[m],arr2[n];
                    for(int i=0;i<m;i++) cin >> arr[i];
                    set<int> s;
                    for(int i=1;i<=n;i++){
                              s.insert(i);
                              arr2[i-1] = 0;
                    }
                    int p=0;
                    for(int i=0;i<m;i++){
                              if(s.find(arr[i])==s.end()){
                                        s.insert(arr[i]);
                                        arr2[n-p-1] = i+1;
                                        p++;
                              }
                    }
                    for(int i=0;i<n;i++){
```

```
                if(arr2[i]==0) cout <<-1 << " ";
                else cout << arr2[i] << " ";
            }
            cout << endl;
        }
}
```

(A) Array Coloring-Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
        int tt;    cin >> tt;
   while(tt--){
      int n;  cin >> n;
      vector<int> vec(n);
      int sum=0;
      for(int i=0;i<n;i++){
         cin >> vec[i];
         sum+=vec[i];
      }
      if(sum%2==0) cout << "YES\n";
      else cout << "NO\n";
   }
}
```

(B) Misha and Changing Handles -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int32_t main(){
	int tt;  cin >> tt;
	string str1,str2;
	map<string,string>mp;
	while(tt--){
		cin >> str1 >> str2;
		bool ok=false;
		for(auto it:mp){
			if(it.second == str1){
				mp[it.first] = str2;
				ok=true;
			}
		}
		if(ok==false) mp[str1] = str2;
	}
	cout << mp.size() << endl;
	for(auto it:mp){
		cout << it.first << " " << it.second << endl;
	}
}
```

(B) Tenzing and Books -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define int long long
stack<int> Reverse(stack<int>st){
	stack<int> temp;
	while(!st.empty()){
		temp.push(st.top());
		st.pop();
	}
	return temp;
}
int32_t main(){
	int tt;  cin >> tt;
	while(tt--){
		int n,x,p;	cin >> n >> x;
		stack<int>st1,st2,st3;
		for(int i=0;i<n;i++){
			cin >> p;
			st1.push(p);
		}
		st1=Reverse(st1);
		for(int i=0;i<n;i++){
			cin >> p;
```

```
        st2.push(p);
}
st2=Reverse(st2);
for(int i=0;i<n;i++){
        cin >> p;
        st3.push(p);
}
st3=Reverse(st3);
int ans = 0;
while(!st1.empty()){
        p = st1.top();
        if((x&p) + (x^p) == x){
                ans = (ans|p);
                st1.pop();
        }
        else break;
}
while(!st2.empty()){
        p = st2.top();
        if((x&p) + (x^p) == x){
                ans = (ans|p);
                st2.pop();
        }
        else break;
}
while(!st3.empty()){
```

```
                p = st3.top();
                if((x&p) + (x^p) == x){
                        ans = (ans|p);
                        st3.pop();
                }
                else break;
        }
        if(ans == x) cout << "YES\n";
        else cout << "NO\n";
    }
}
```

(A) Tenzing and Tsondu -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define int long long
int32_t main(){
    int tt;  cin >> tt;
    while(tt--){
        int n,m;    cin >> n >> m;
        vector<int>vec(n);
        int sum=0,sum1=0;
        for(int i=0;i<n;i++) {
            cin >> vec[i];
```

```
            sum+=vec[i];
        }
        vector<int>vec1(m);
        for(int i=0;i<m;i++){
            cin >> vec1[i];
            sum1+=vec1[i];
        }
        if(sum==sum1) cout << "Draw\n";
        else if(sum>sum1) cout << "Tsondu\n";
        else cout << "Tenzing\n";

    }
}
```

(A) Cipher Shifer -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int32_t main(){
    int tt;  cin >> tt;
    while(tt--){
        int n;  cin >> n;
        string str;     cin >> str;
        char ch=str[0];
        for(int i=1;i<str.size();i++){
```

```
                if(str[i]!=ch){
                        continue;
                }
                else{
                        cout << ch;
                        ch=str[i+1];
                        i++;
                }
        }
        cout << endl;
    }
}
```

(C) Soldier and Cards -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
queue<int> insertToBottom(queue<int>s,int data){
    queue<int>temp;
    while(!s.empty()){
        temp.push(s.front());
        s.pop();
    }
    s.push(data);
```

```
        while(!temp.empty()){
                s.push(temp.front());
                temp.pop();
        }
        return s;
}
int32_t main(){
        int n;  cin >> n;
        int k1;cin >> k1;
        queue<int>st1;
        for(int i=0;i<k1;i++){
                int x;   cin >> x;
                st1.push(x);
        }
        int k2;cin >> k2;
        queue<int>st2;
        for(int i=0;i<k2;i++){
                int x;   cin >> x;
                st2.push(x);
        }
        int cunt = 0;
        while(1){
                if(st1.size()==0 || st2.size()==0) break;
                int x = st1.front();
                st1.pop();
                int y = st2.front();
```

```
            st2.pop();
            if(x>y){
                st1.push(y);
                st1.push(x);
                cunt++;
            }
            else if(x<y){
                st2.push(x);
                st2.push(y);
                cunt++;
            }
            if(cunt>=n*n*n){
                cunt =-1;
                break;
            }
        }
        if(cunt!=0) cout << cunt << " ";
        if(st1.size()!=0 && cunt!=-1) cout << 1 << endl;
        else if(cunt!=-1) cout << 2 << endl;
}
```

(B) Minimize the Permutation -Codeforces

```
#include <bits/stdc++.h>
using namespace std;
int main() {
	int tt;  cin >> tt;
	while(tt--){
		int n;  cin >> n;
		vector<int>vec(n);
		for(int i=0;i<n;i++){
			cin >> vec[i];
		}

		int now = 0;
		while(now<n){
			int idx = min_element(vec.begin()+now,vec.end())-vec.begin();
			int data = vec[idx];
			vec.erase(vec.begin()+idx);
			vec.insert(vec.begin()+now, data);
			if(idx==now) now=idx+1;
			else now = idx;
		}
		for(auto it:vec) cout << it << " ";
		cout << endl;
	}
}
```

(A) Payment Without Change -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define int long long
int32_t main(){
	int tt;  cin >> tt;
	while(tt--){
		int a,b,n,s;    cin >> a >> b >> n >> s;
		bool ok = false;
		if(s/n<=a){
			int r = s%n;
			if(r<=b) ok = true;
			else ok = false;
		}
		else{
			int p = n*a;
			int diff = s-p;
			if(diff<=b) ok = true;
			else ok=false;
		}
		if(ok) cout << "YES\n";
		else cout << "NO\n";
	}
}
```

(A) Sasha and Array Coloring -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int32_t main(){
	int tt;  cin >> tt;
	while(tt--){
		int n;  cin >> n;
		vector<int>vec(n);
		for(int i=0;i<n;i++)
			cin >> vec[i];
		sort(vec.begin(),vec.end());
		int ans = 0;
		for(int i=0;i<n/2;i++){
			ans+=(vec[n-i-1]-vec[i]);
		}
		cout << ans << endl;
	}
}
```

(B) Maximum Strength -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int32_t main(){
   int tt; cin >> tt;
   while(tt--){
      string str1,str2; cin >> str1 >> str2;
      reverse(str1.begin(), str1.end());
      reverse(str2.begin(), str2.end());
      int len1 = str1.size(), len2 = str2.size();
      vector<int> vec1(101),vec2(101);
      for(int i = 0; i < len1; i++) vec1[i] = (str1[i]-'0');
      for(int i = 0; i < len2; i++) vec2[i] = (str2[i]-'0');
      int p = 0,d=0;
      for(int i = 100; i >=0; i--){
         if(vec1[i] != vec2[i]){
            p = i;
            d = abs(vec1[i]-vec2[i]);
            break;
         }
      }
      cout << 9*p+d << endl;
   }
}
```

(A) Unit Array -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int32_t main(){
   int tt; cin >> tt;
   while(tt--){
      int n;  cin >> n;
      vector<int>vec(n);
      int posi=0,neg=0;
      for(int i = 0; i < n; i++){
         cin >> vec[i];
         if(vec[i]>0) posi++;
         else neg++;
      }
      int cunt = 0;
      if(posi>neg && neg==0) cunt = 0;
      else if(posi>neg && neg%2==0) cunt = 0;
      else{
         while(neg>posi){
            posi++;
            neg--;
            cunt++;
         }
      }
      if(neg%2!=0) cunt++;
```

```
        cout << cunt << endl;
    }
}
```

(A) Packing Rectangles -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define int long long
const int MAX_L = 1e14;
bool ok(int mid,int w,int h,int n){
    int a= mid/w;
    int b= mid/h;
    if(b==0) return false;
    return a>=(double)n/b;
}
int32_t main(){
    ios_base::sync_with_stdio(0);
    cin.tie(0);
    int w,h,n;  cin >> w >> h >> n;
    int l=1,r=MAX_L-1;
    int ans = 0;
    while(l<=r){
        int mid = (l+r)/2;
```

```
        if(ok(mid,w,h,n)){
            ans = mid;
            r=mid-1;
        }
        else l=mid+1;
    }
    cout << ans << endl;
}
```

(B) Closest to the Left -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    ios_base::sync_with_stdio(true);
    cin.tie(0);
    int n,k; cin >> n >> k;
    vector<int>vec(n);
    for(int i = 0; i < n;i++) cin >> vec[i];
    for(int i=0;i<k;i++){
        int x;  cin >> x;
        auto it = upper_bound(vec.begin(), vec.end(),x);
        cout << (it-vec.begin()) << endl;
    }
}
```

(C) Contrast Value -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
   ll tt;  cin >> tt;
   while(tt--){
      ll n; cin >> n;
      vector<ll> vec;
      for(ll i=0; i<n;i++){
         ll x;   cin >> x;
         vec.push_back(x);
      }
     ll cunt = 0,p=0;
     for(ll i=0;i<n-1;i++){
      if(vec[i]<vec[i+1]){
         if(p!=1) cunt++;
         p = 1;
      }
      else if(vec[i]>vec[i+1]){
         if(p!=-1) cunt++;
         p =-1;
      }
     }
     cout << cunt + 1 << endl;
```

```
    }
}
```

(A) Divisible Array -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
    ll tt;  cin >> tt;
    while(tt--){
        ll n;   cin >> n;
        vector<ll> vec(n);
        ll sum=0;
        for(ll i=1;i<n;i++){
            vec[i]=i+1;
            sum += vec[i];
        }
        ll div = sum/n;
        div++;
        vec[0] = (div*n)-sum;
        for(auto it:vec){
            cout << it << " ";
        }
```

```
        cout << endl;
    }
}
```

(D) Gold Rush -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
    ll tt;  cin >> tt;
    while(tt--){
        ll n,m;   cin >> n >> m;
        ll gcd = __gcd(n,m);
        n = n/gcd;
        m=m/gcd;
        ll cuntN=0,cuntM=0;
        while(n%3==0){
            cuntN++;
            n=n/3;
        }
        while(m%2==0){
            cuntM++;
            m=m/2;
        }
```

```
        if(n==1 && m==1 && cuntM<=cuntN){
            cout << "YES" << "\n";
        }
        else{
            cout << "NO" << "\n";
        }
    }
}
```

(B) Blank Space -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
    ll tt;  cin >> tt;
    while(tt--){
        ll n;   cin >> n;
        vector<ll>vec;
        for(ll i=0;i<n;i++){
            ll x;   cin >> x;
            vec.push_back(x);
        }
        ll cunt=0,ans=0;
        for(ll i=0;i<n;i++){
```

```
            if(vec[i]==0) cunt++;
            else{
                ans = max(cunt,ans);
                cunt=0;
            }
        }
        ans = max(cunt,ans);
        cout << ans <<endl;
    }
}
```

(A) Love Story -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
    ll tt;  cin >> tt;
    string s="codeforces";
    while(tt--){
        string str; cin >> str;
        ll cunt=0;
        for(ll i=0;i<str.size();i++){
            if(str[i]!=s[i]) cunt++;
```

```
    }
    cout << cunt << endl;
  }
}
```

(B) Lunatic Never Content -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
  ll tt;  cin >> tt;
  while(tt--){
    ll n;   cin >> n;
    vector<ll>vec,vec2;
    for(ll i=0;i<n;i++){
      ll x;   cin >> x;
      vec.push_back(x);
    }
    ll max = 0;
    for(ll i=0;i<n/2;i++){
      ll k = abs(vec[i]-vec[n-i-1]);
      if(k==0){
        continue;
      }
```

```
            if(i==0){
                max  = k;
            }
            else{
                max  = __gcd(k,max );
            }
        }
        cout << max  << endl;
    }
}
```

(A) Matching -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
    ll tt;  cin >> tt;
    while(tt--){
        string str; cin >> str;
        ll len = str.size();
        ll cunt=1;
        if(str[0]=='?') cunt = 9;
        for(ll i=1;i<len;i++){
            if(str[i]=='?') cunt = cunt*10;
```

```
        }
        if(str[0]=='0') cunt = 0;
        cout << cunt << endl;
    }
}
```

(A) Yura's New Name -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
    ll tt;  cin >> tt;
    while(tt--){
        string str; cin >> str;
        ll cunt = 0,len=str.size(),p=0;
        for(ll i=0;i<str.size();i++){
            if(str[i]=='_'){
                if(str[i+1]!='^'){
                    str.insert(i+1,"^");
                }
            }
        }
        ll len2=str.size()-len;
        if(str[0]=='_') len2++;
```

```
        if(len2==0 && str[0]=='^' && len==1)len2++;
        cout << len2 << endl;
    }
}
```

(A) Ian Visits Mary -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
    ll tt;  cin >> tt;
    while(tt--){
        ll a,b; cin >> a >> b;
        cout << "2" << '\n';
        cout << "1" << " " << b-1 << '\n';
        cout << a << " " << b << '\n';
    }
}
```

(A) Li Hua and Maze -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
   ll tt;  cin >> tt;
   while(tt--){
      ll row,col; cin >> row >> col;
      ll a,b,c,d; cin >> a >> b >> c >> d;
      ll cost = 0;
      if((a==1 && b==1) || (c==1 && d==1) || (a==row && b==col) || (c==row && d==col) || (a==1 && b==col) || (c==1 && d== col) || (a==row && b==1) || (c==row && d==1)||(c==row && d==1)){
         cost = 2;
      }
      else if(a==1 || a==row || c==1 || c==row || b==col || b==1 || d==1 || d==col){
         cost = 3;
      }
      else cost = 4;
      cout << min(min(row,col),cost) << endl;
   }
}
```

(B) Long Legs -Codeforces

```
#include <bits/stdc++.h>
using namespace std;
#define ll long long
int main() {
   ll tt;   cin >> tt;
   while (tt--) {
      ll x, y;   cin >> x >> y;
      ll ans = 1e9;
      ll mx = max(x,y),mn = min(x,y);
      for(ll i=1; i<100002;i++){
         ll p = (mx+i-1)/i + (mn+i-1)/i + i-1;
         ans = min(ans,p);
      }
      cout << ans << endl;
   }
}
```

(A) Coins -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
   ll tt;  cin >> tt;
   while(tt--){
```

```
        ll n,k; cin >> n>>k;
        if(n%2!=0 && k%2==0) cout << "NO" << '\n';
        else cout << "YES" << '\n';
    }
}
```

(E) Living Sequence -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
    ll tt;  cin >> tt;
    while(tt--){
        ll n;   cin >> n;
        string str = to_string(n);
        vector<ll> vec;
        while(n>0){
            ll r = n%9;
            vec.push_back(r);
            n/=9;
        }
        ll p=0;
        for(ll i=vec.size()-1;i>=0;i--){
            p = 10*p+vec[i];
```

```
        }
        str = to_string(p);
        replace(str.begin(), str.end(),'8','9');
        replace(str.begin(), str.end(),'7','8');
        replace(str.begin(), str.end(),'6','7');
        replace(str.begin(), str.end(),'5','6');
        replace(str.begin(), str.end(),'4','5');
        cout << str << endl;
    }
}
```

(D) Umka and a Long Flight -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
vector<ll> vec;
bool solve(ll x,ll y,ll n){
    if(n==1) return true;
    if(min(y,vec[n+1]-y+1) > vec[n+1]-vec[n]) return false;
    y = min(y,vec[n+1]-y+1);
    return solve(y,x,n-1);
}
```

```
int main(){
   ll tt;  cin >> tt;
   vec.push_back(1);
   vec.push_back(1);
   for(ll i=0;i<50;i++){
      vec.push_back(vec[i]+vec[i+1]);
   }
   while(tt--){
      ll n,x,y;   cin >> n >> x >> y;
      if(solve(x,y,n)) cout << "YES\n";
      else cout << "NO\n";
   }
}
```

(C) Restore the Array -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
   ll tt;  cin >> tt;
   while(tt--){
      ll n;   cin >> n;
      n--;
      vector<ll>vec(n),ans(n+1);
```

```
        for(ll i=0; i<n; i++) cin >> vec[i];
        ans[0] = vec[0];
        ans[n] = vec[n-1];
        for(ll i=0;i<n-1;i++){
            ans[i+1] = min(vec[i],vec[i+1]);
        }
        for(ll i=0;i<n+1;i++){
            cout << ans[i] << " ";
        }
        cout << endl;
    }
}
```

(B) Conveyor Belts -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
    ll tt;  cin >> tt;
    while(tt--){
        ll n,a,b,c,d;   cin >> n >> a >> b >> c >> d;
        a--; b--;c--;d--;
        a=min(a,n-1-a);
        b=min(b,n-1-b);
```

```
        c=min(c,n-1-c);
        d=min(d,n-1-d);
        cout << abs(min(a,b)-min(c,d)) << endl;
    }
}
```

(A) Insert Digit -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
    ll tt;  cin >> tt;
    while(tt--){
        ll n,m; cin >> n >> m;
        string str; cin >> str;
        ll p=-1;
        for(ll i=0;i<n;i++){
            if(str[i]-'0'<m){
                p = i;
                break;
            }
        }
        for(ll i=0;i<n;i++){
            if(i!=p) cout << str[i];
```

```
        else{
            cout << m << str[i];
        }
      }
      if(p==-1) cout << m;
      cout << endl;
   }
}
```

(B) Was it Rated?

```
#include<bits/stdc++.h>
using namespace std;
int main(){
   int n;  cin >> n;
   if(n==15 || n==20||n==21) cout << "NO\n";
   else cout << "YES\n";
}
```

(B) The String Has a Target -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
   ll tt;  cin >> tt;
   while(tt--){
      ll n;   cin >> n;
      string str; cin >> str;
      ll p=0;
      char ch=str[0];
      for(ll i=1;i<n;i++){
         if(ch>=str[i]){
            ch=str[i];
            p=i;
         }
      }
      cout << str[p];
      for(ll i=0;i<n;i++){
         if(i!=p) cout << str[i];
      }
      cout << endl;
   }
}
```

(A) We Need the Zero -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
   ll tt;  cin >> tt;
   while(tt--){
      ll n;   cin >> n;
      vector<ll>vec(n),XOR(n);
      ll p=-1;
      for(ll i=0;i<n;i++) cin >> vec[i];
      for(ll x=0;x<=256;x++){
         for(ll i=0;i<n;i++){
            XOR[i] = vec[i]^x;
         }
         ll ans = 0;
         for(auto it:XOR){
            ans = ans^it;
         }
         if(ans == 0){
            p=x;
            break;
         }
      }
      cout << p << endl;
```

```
    }
}
```

(A) Beautiful Sequence -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
#define ll long long
int main(){
    ll tt;  cin >> tt;
    while(tt--){
        ll n;   cin >> n;
        vector<ll> vec(n+1);
        ll cunt = 0;
        for(ll i=1;i<=n;i++){
            cin >> vec[i];
            if(vec[i] == i) cunt++;
        }
        if(cunt!=0) cout << "YES" << '\n';
        else{
            for(ll i=1;i<=n;i++){
                for(ll j=i+1;j<=n;j++){
                    if(i==vec[j]) cunt++;
                }
```

```
        }
        if(cunt!=0) cout << "YES" << '\n';
        else cout << "NO" << '\n';
      }
   }
}
```

(A) Showstopper -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
   int tt; cin >> tt;
   while(tt--){
      int n;  cin >> n;
      vector<int>vec1(n),vec2(n);
      for(int i=0;i<n;i++) cin >> vec1[i];
      for(int i=0;i<n;i++) cin >> vec2[i];
      for(int i=0;i<n;i++){
         if(vec1[i]>vec2[i] && vec2[i]<=vec1[n-1]) swap(vec1[i],vec2[i]);
      }
      int p=vec1[n-1],q=vec2[n-1];
      sort(vec1.begin(),vec1.end());
      sort(vec2.begin(),vec2.end());
      if(vec1[n-1] == p && vec2[n-1] == q) cout << "YES" << '\n';
```

```
        else cout << "NO" << '\n';
    }
}
```

(B) Points on Plane -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    long long tt,i,p;   cin >> tt;
    while(tt--){
        long double n; cin >> n;
        cout <<(long long) sqrt(n-1) << '\n';
    }
}
```

(A) Garland -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    int tt;   cin >> tt;
    while(tt--){
        string str; cin >> str;
        map<char,int> mp;
```

```
        for(int i=0;i<4;i++){
            mp[str[i]]++;
        }
        sort(str.begin(), str.end());
        if(mp.size() == 1) cout <<-1 << '\n';
        else if(mp.size() == 4 || mp.size() == 3) cout << 4 << '\n';
        else if(mp.size() == 2){
            if(str[0] == str[2]) cout << 6 << '\n';
            else if(str[1] == str[3]) cout << 6 << '\n';
            else cout << 4 << '\n';
        }
        mp.clear();
    }
}
```

(B) AND 0, Sum Big -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
long long INF = 1e9+7;
int main(){
    int tt; cin >> tt;
    while(tt--){
        long long n,k;    cin >> n >> k;
        long long cunt = 0;
```

```
        long long p = 1;
        for(int i=0;i<k;i++){
            p = p*n;
            p = p%INF;
        }
        cout << p << endl;
    }
}
```

(A) Mocha and Math -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    int tt; cin >> tt;
    while(tt--){
        int n;  cin >> n;
        vector<int>vec(n);
        for(int i=0; i<n; i++) cin >> vec[i];
        int ans = vec[0];
        for(int i=1; i<n; i++){
            ans = ans&vec[i];
        }
        cout << ans << endl;
    }
```

```
}
```

(B) AGAGA XOOORRR -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
   int tt; cin >> tt;
   while(tt--){
      int n;  cin >> n;
      vector<int>vec(n);
      int x=0;
      for(int i=0; i<n; i++){
         cin >> vec[i];
         x = x^vec[i];
      }
      if(x==0) cout << "YES" << '\n';
      else{
         int cunt = 0, k = 0;
         for(int i=0;i<n;i++){
            k = k^vec[i];
            if(k == x){
               cunt++;
               k = 0;
            }
         }
```

```
        if(cunt>=3) cout << "YES" << '\n';
        else cout << "NO" << '\n';
    }
  }
}
```

(G2) Subsequence Addition (Hard Version) - Codeforces

```
#include <bits/stdc++.h>
using namespace std;
int main(){
  long long tt,n,i;
  cin >> tt;
  while (tt--){
    cin >> n;
    vector<long long> vec(n), sum(n);
    for (i = 0; i < n; i++) cin >> vec[i];
    sort(vec.begin(), vec.end());
    sum[0] = vec[0];
    for (i = 1; i < n; i++){
      sum[i] = vec[i] + sum[i- 1];
    }
    bool ok = true;
    for (i = 1; i < n; i++){
      if (sum[i- 1] < vec[i]) ok = false;
```

```
        }
        if (vec[0] != 1) ok = false;
        if (ok) cout << "YES" << '\n';
        else cout << "NO" << '\n';
    }
}
```

(G1) Subsequence Addition (Easy Version) - Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    int tt; cin >> tt;
    while(tt--){
        int n;  cin >> n;
        vector<int>vec(n),sum(n);
        for(int i=0; i<n; i++) cin >> vec[i];
        sort(vec.begin(), vec.end());
        sum[0] = vec[0];
        for(int i=1;i<n;i++) sum[i] = vec[i]+sum[i-1];
        bool ok = true;
        for(int i=1;i<n;i++){
            if(sum[i-1]<vec[i]) ok = false;
        }
        if(vec[0]!=1) ok = false;
```

```
        if(ok) cout << "YES" << '\n';
        else cout << "NO" << '\n';
    }
}
```

(D) Odd Queries -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    int n,q,l,r,k,i,j,sum=0,sum1=0,tt,k1,k2,ans;
    cin >> tt;
    while(tt--){
        cin >> n >> q;
        vector<int>vec(n),sum(n),sum1(n);
        for(i=0;i<n;i++) cin >> vec[i];
        sum[0] = vec[0];
        for(i=1;i<n;i++) sum[i] = vec[i] + sum[i-1];

        for(i=0;i<q;i++){
            cin >> l >> r >> k;
            if(l>=2) k1 = sum[r-1]- sum[l-2];
            else k1 = sum[r-1];
            k2 = k*((r-l)+1);
            ans = sum[n-1]+k2-k1;
```

```
        if(ans%2 != 0) cout << "YES" << '\n';
        else cout << "NO" << '\n';
    }
  }
}
```

(C) Find and Replace -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
  int tt; cin >> tt;
  while(tt--){
    int n;  cin >> n;
    string str; cin >> str;
    bool ok = true;
    for(int i=0;i<n;i++){
      for(int j=i+1; j<n;j++){
        if(str[i] == str[j]){
          if(i%2!=0 && j%2==0) ok = false;
          else if(i%2==0 && j%2!=0) ok = false;
        }
      }
    }
    if(ok)cout << "YES" << '\n';
```

```
        else cout << "NO" << '\n';
    }
}
```

(B) Grab the Candies -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    int tt; cin >> tt;
    while(tt--){
        int n;  cin >> n;
        int even = 0, odd = 0;
        vector<int> vec(n);
        for(int i=0;i<n;i++){
            cin >> vec[i];
            if(vec[i] % 2 == 0) even += vec[i];
            else odd += vec[i];
        }
        if(even > odd) cout << "YES" << '\n';
        else cout << "NO" << '\n';
    }
}
```

(B) Mex Master -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
   int tt; cin >> tt;
   while(tt--){
      int n, mx =-1;  cin >> n;
      vector<int>vec;
      int zero=0,non_zero=0;
      for(int i=0;i<n;i++){
         int x;  cin >> x;
         if(x != 0) non_zero++;
         else zero++;
         mx = max(mx,x);
         vec.push_back(x);
      }
      int ans;
      if(zero == 0) ans = 0;
      else{
         if(non_zero >= zero-1) ans = 0;
         else{
            if(mx == 1) ans = 2;
            else ans = 1;
         }
      }
```

```
        cout << ans << endl;
    }
}
```

(A) Walking Master -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    int tt; cin >> tt;
    while(tt--){
        int a,b,c,d,p=0;    cin >> a >> b >> c >> d;
        if(a>c){
            p = a-c;
            a = a-p;
        }
        else if(c>a){
            p = c-a;
            a = a+p;
            b = b+p;
        }
        if(b>d) cout <<-1 << endl;
        else{
            cout << p + 2*(d-b) << endl;
```

```
    }
  }
}
```

(B) Vaccination -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
  int tt; cin >> tt;
  int n, k, d, w,p;
  while(tt--){
    cin >> n >> k >> d >> w;
    int ans = 0,cunt=0;
    vector<int>vec(n);
    for(int i = 0; i <n; i++) cin >> vec[i];
    for(int i=0;i<n;i++){
      if(cunt==0) p = vec[i]+w+d;
      if(vec[i]<=p && cunt<k){
        cunt++;
      }
      if(cunt>=k || vec[i+1] > p){
        cunt = 0;
        ans++;
      }
```

```
        }
        if(cunt!=0) cout << ans+1<<endl;
        else cout << ans << endl;
    }
}
```

(A) Lame King -Codeforces

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    int tt; cin >> tt;
    while(tt--){
        int a, b;   cin >> a >> b;
        int p = abs(abs(a)-abs(b));
        if(p==1 || p==0) cout << abs(a)+abs(b) << endl;
        else cout << 2*min(abs(a),abs(b))+ 2*p-1 << endl;
    }
}
```

(A) Typical Interview Problem -Codeforces

```
#include<bits/stdc++.h>

using namespace std;

int main(){

   int tt; cin >> tt;

   string s =
"FBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBF
FBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFF
BFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBF
FBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFFBFBFFBFF
BFBFFBFF";

   while(tt--){

      int n;  cin >> n;

      string str; cin >> str;

      int p=0,k=0;

      for(int i=0;i<s.size();i++){

         string str2 = s.substr(i,i+n-k);

         k++;

         if(str2==str){

            p=1;

            break;

         }

      }

      if(p==1)  cout << "YES\n";

      else cout << "NO\n";

   }

}
```