```
#include<bits/stdc++.h>
                                                                                  } return ans;
#include <ext/pb_ds/assoc_container.hpp>
                                                                                }
#include <ext/pb_ds/tree_policy.hpp>
using namespace std;
                                                                                // Sorting
using namespace __gnu_pbds;
                                                                                bool sorta(pll a,pll b){ return a.second<b.second;}</pre>
template <typename T>
                                                                                bool sortd(pll a,pll b){ return a.second>b.second;}
using ordered_set= tree<T, null_type,less<T>,
rb_tree_tag,tree_order_statistics_node_update>; //ordered_set
                                                                                bool isPrime(II n){
template <typename T>
                                                                                  if (n<=1)return false; if(n<=3)return true; if(n\%2==0 \mid \mid n\%3==0)
using multi_ordered_set= tree<T, null_type,less_equal<T>,
                                                                                return false:
                                                                                  for (II i=5;i*i<=n;i=i+6) if(n%i==0 || n%(i+2)==0) return false;
rb_tree_tag,tree_order_statistics_node_update>; //multiple_ord
ered set
                                                                                  return true;
// #Define
                                                                                II factorial(II n){
#define Good Luck
                                                                                  if(n<0) return -1;
ios base::sync with stdio(0);cin.tie(0);cout.tie(0);
                                                                                  else if(n==0) return 1;
#define II long long
                                                                                  else return n*factorial(n-1);
#define int long long
#define Id long double
                                                                                Il permutation(Il n, Il r) {
#define pb push back
                                                                                  if (n < r) return -1;
#define eb emplace back
                                                                                  return factorial(n)/factorial(n-r);
#define pp pop_back
                                                                                Il combination(Il n,Il r){
#define pf push_front
#define ub upper_bound
                                                                                  if(n<r) return -1;
                                                                                  else return factorial(n)/factorial(n-r)/factorial(r);
#define lb lower_bound
#define MP make_pair
#define YES cout<<"YES\n"
                                                                                void primeFactors(int n){
#define NO cout<<"NO\n"
                                                                                  while(n%2==0){
#define emo cout<<"('_')\n"
                                                                                    cout<<2<<" ", n=n/2;
#define all(v) v.begin(),v.end()
#define rall(v) v.rbegin(), v.rend()
                                                                                  for(int i=3;i*i <= n;i=i+2){
#define extra(n) fixed<<setprecision(n)
                                                                                     while(n\%i==0){
#define For(n) for(II i=0;i<n;i++)
                                                                                       cout<<i<" ", n=n/i;
#define vII vector<II>
#define pll pair<II,II>
#define mpl map<II,II>
                                                                                  if(n>2) cout<<n<<" ";
#define umpl unordered_map<II,II>
#define III list<II>
                                                                                struct SimpleHash {
#define stl stack<ll>
                                                                                  long long len, base, mod;
#define qll queue<ll>
                                                                                  vector<long long> P, H, R;
#define pql priority_queue<II>
                                                                                  SimpleHash() {}
#define sll set<ll>
                                                                                  SimpleHash(string str, long long b, long long m) {
#define msl multiset<ll>
                                                                                     base = b, mod = m, len = str.size();
#define osl ordered_set<ll>
                                                                                     P.resize(len + 4, 1), H.resize(len + 3, 0), R.resize(len + 3, 0);
#define mosl multi_ordered_set<II>
                                                                                     for (long long i = 1; i \le len + 3; i++)
#define mem(v,flag) memset(v, flag, sizeof(v))
                                                                                       P[i] = (P[i - 1] * base) % mod;
                                                                                     for (long long i = 1; i \le len; i++)
// Const
                                                                                       H[i] = (H[i-1] * base + str[i-1]+1007) % mod;
const II mod=1000000007;
                                                                                     for (long long i = len; i >= 1; i--)
const II N=200005;
                                                                                       R[i] = (R[i + 1] * base + str[i - 1] + 1007) \% mod;
const II inf=LLONG MAX;
const II minf=LLONG_MIN;
                                                                                  inline long long range_hash(long long I, long long r) {
                                                                                    long long hashval = (H[r+1] - (P[r-l+1] * H[l] % mod))%mod;
// Mathematical functions
                                                                                     return (hashval < 0 ? hashval + mod : hashval);
II gcd(II a, II b) \{if (b==0) return a; return <math>gcd(b,a\%b);\} // gcd
II lcm(II a, II b) {return (a/gcd(a,b) * b);}
                                                                                  inline long long reverse_hash(long long I, long long r) {
II power(II x, II y) { II a=1; for(II i=0; i< y; i++) a*= x; return a;}
                                                                                    long long hashval = R[l + 1] - (P[r - l + 1] * R[r + 2] \% mod);
Il square_root(Il x) {
                                                                                     return (hashval < 0 ? hashval + mod : hashval);
 II low=1,high=3e9,ans=1; while(low<=high) {
                                                                                  }
    II mid = (low + high)/2;
                                                                                };
    if (mid*mid<=x){ans=mid;low=mid+1;} else high=mid-1;
                                                                                struct DoubleHash {
```

```
SimpleHash sh1, sh2;
                                                                                  for(auto it:s) cout<<it<<" ";
  DoubleHash() {}
                                                                                  cout<<endl;
  DoubleHash(string str) {
    sh1 = SimpleHash(str, 1949313259, 2091573227);
                                                                                void print(multiset<int>s){
    sh2 = SimpleHash(str, 1997293877, 2117566807);
                                                                                  for(auto it:s) cout<<it<<" ";
                                                                                  cout<<endl;
  long long concate(DoubleHash& B, long long l1, long long r1,
long long 12, long long r2) {
                                                                                void print(map<int,int>mp){
                                                                                  for(auto it:mp) cout<<it.first<<" "<<it.second<<endl;
    long long len1 = r1 - l1+1, len2 = r2 - l2+1;
    long long x1 = sh1.range_hash(l1, r1) ,
    x2 = B.sh1.range_hash(l2, r2);
                                                                                void print(stack<int>st){
    x1 = (x1 * B.sh1.P[len2]) % 2091573227;
                                                                                  while(!st.empty()) cout<<st.top()<< " ",st.pop();</pre>
    long long newx1 = (x1 + x2) % 2091573227;
                                                                                  cout<<endl;
    x1 = sh2.range hash(l1, r1);
    x2 = B.sh2.range hash(I2, r2);
                                                                                void print(queue<int>q){
    x1 = (x1 * B.sh2.P[len2]) % 2117566807;
                                                                                  while(!q.empty()) cout<<q.front()<<" ",q.pop();</pre>
    long long newx2 = (x1 + x2) % 2117566807;
                                                                                  cout<<endl;
    return (newx1 << 32) ^ newx2;
                                                                                int time_limit=1e9,time_count=0;
  inline long long range_hash(long long I, long long r) {
                                                                                bool checkTime(){
    return (sh1.range_hash(l, r) << 32) ^ sh2.range_hash(l, r);
                                                                                  time count++;
                                                                                  if(time_count>time_limit){
                                                                                    cout<<"Time Limit Apprehension (-_-)"<<endl;
  inline long long reverse_hash(long long I, long long r) {
    return (sh1.reverse_hash(l, r) << 32) ^ sh2.reverse_hash(l, r);
                                                                                    return false;
 }
                                                                                  }
};
                                                                                  return true;
class DisjointSet {
  private:
                                                                                vll intToBin(int n){
    int parent[N];
                                                                                  vll bin(32);
    int size[N];
                                                                                  for(int i=0;i<32;i++) bin[31-i]=n&1, n>>=1;
  public:
                                                                                  // for(int i=0;i<32;i++) cout<<bir[i]<<" ";
    DisjointSet() {
                                                                                  // cout<<endl;
      for(int i=0;i<N;i++) {
                                                                                  return bin;
         parent[i]=i;
         size[i]=1;
                                                                                II bigmod(II a,II p,II m){
                                                                                  if(p == 0) return 1;
      }
    }
                                                                                  II q = bigmod(a, p/2, m);
    void make_set(int v) {
                                                                                  if(p % 2 == 0) return (q*q) % m;
      parent[v]=v;
                                                                                  return (q*((q*a) % m)) % m;
      size[v]=1;
                                                                               // #define LOCAL
    int find_set(int v) {
                                                                               // #include "debug.h"
      if(v==parent[v]) return v;
                                                                                #define dbg(x)
      return parent[v]=find_set(parent[v]); // Path compression
                                                                               // MyTask
    void union_sets(int a,int b) {
      a=find_set(a);
                                                                                void solve(int &t,int &T){
      b=find_set(b);
                                                                                  // II in,n,m,i,j,k,x,y;
      if(a!=b) {
                                                                                  int n; cin>>n;
         // Union by size
         if(size[a]<size[b]) swap(a,b);</pre>
         parent[b]=a;
         size[a]+=size[b];
                                                                                main()
    }
                                                                                  Good_Luck;
                                                                                  int T=1;
void print(vector<int>v){
                                                                                  cin>>T;
  for(int i=0;i<v.size();i++) cout<<v[i]<<" ";
                                                                                  for(int t=1;t<=T;t++){
  cout<<endl;
                                                                                    solve(t,T);
void print(set<int>s){
                                                                               }
```