Heaven's Light Is Our Guide

Rajshahi University of Engineering & Technology

Department of Computer Science & Engineering

Course Code: CSE 2102

Course Title: Discrete Mathematics Sessional

Experiment No. 02

Submitted By	Submitted To
Name : Khandoker Sefayet Alam	Md. Azmain Yakin Srizon
Roll: 2003121	Lecturer
Section: C, Session: 2020-2021	Department of CSE, RUET

Submission Date: 31/05/23

Problem-1:

Link: https://codeforces.com/problemset/problem/122/A

Solution:

```
#include <bits/stdc++.h>
#include <sstream>
using namespace std;
using ll = long long;
using vl = vector<ll>;
#define fast ios_base::sync_with_stdio(0);cin.tie(0);cout.tie(0);



int main()
{
   fast;
   string s;
   cin>>s;
   bool b=true;
   for(int i=0;i<s.size();i++)
   {
      if(s[i]=='4' || s[i]=='7') b=true;
      else {b=false; break;}
   }
   stringstream geek(s);
   int x = 0;
   geek >> x;
   if(x%4==0 || x%7==0  || x%44==0  || x%47==0  || x%74==0  || x%77==0  || x%444==0  ||
x%447==0  || x%477==0 || x%744==0 || x%747==0 || x%777==0)  {b=true;}



   if(b==true) cout<<"YES\n";
```

```
    else cout<<"NO\n";
    return 0;
}
```

Status:

General

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
147545232	Practice: sefayetalam14	122A - 9	GNU C++14	Accepted	30 ms	8 KB	2022-02-24 10:46:07	2022-02-24 10:46:07		Compare

Problem-2:

Link: https://codeforces.com/problemset/problem/1521/A

Solution:

```
#include<bits/stdc++.h>
#include<stdio.h>
using namespace std;


#define ll                long long
#define M 100006
ll modfunc(ll a,ll b,ll c) {

        ll t=1,s=a;

        while(b>0){
        if(b%2){t=(t*s)%c;}
        s=(s*s)%c; b/=2;
        }

        return t%c;

}
```

```
const ll N=2e5+1;
ll arr[N][19];

int main()
{

    ll t;
    ll tno=1;;
    //t=1;
    cin>>t;

    while(t--){
      ll a,b;
      cin>>a>>b;
      if(a*(b+1)%(a*b)==0) {cout<<"NO"<<endl;}
      else{
         cout<<"YES"<<endl;
         cout<<a*b<<" "<<a<<" "<<a*b+a<<endl;
      }}

return 0;
}
```

Status:

General

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
162340416	Practice: sefayetalam14	1521A - 46	GNU C++14	Accepted	77 ms	29752 KB	2022-06-30 15:57:06	2022-06-30 15:57:06	☆	Compare

Problem-3:

Link: https://codeforces.com/problemset/problem/1473/B

Solution:

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

```
using namespace std;


#define ll                long long
#define Setpre(n) cout<<fixed<<setprecision(n)
inline ll GCD(ll a, ll b) { return b == 0 ? a : GCD(b, a % b); }
inline ll LCM(ll a, ll b) { return a * b / GCD(a, b); }
inline ll Ceil(ll p, ll q)  {return p < 0 ? p / q : p / q + !!(p % q);}
inline ll Floor(ll p, ll q) {return p > 0 ? p / q : p / q - !!(p % q);}
inline double logb(ll base,ll num){ return (double)log(num)/(double)log(base);}
#define M 10000


inline bool isPerfectSquare(long double x){ if (x >= 0) { long long sr = sqrt(x);return (sr * sr == x); }return false; }
double euclidean_distance(ll x1,ll y1,ll x2,ll y2){double a=(x2-x1)*(x2-x1);double b=(y2-y1)*(y2-y1);double c=(double)sqrt(a+b);return c;}
int popcount(ll x){return __builtin_popcountll(x);};
int poplow(ll x){return __builtin_ctzll(x);};
int pophigh(ll x){return 63 - __builtin_clzll(x);};


int main()
{
    fast;
     ll t;
    //setIO();
     //ll tno=1;;
     //t=1;
    cin>>t;
```

```
while(t--){
    string a,b;
    cin>>a>>b;
    bool f=0;
    if(a.size()>b.size()){
        ll n=a.size();
        ll m=b.size();
         ll lcm=LCM(n,m);
         string toadd=a;
        while(a.size()<lcm){

        a+=toadd;
        }
      //cout<<lcm<<" "<<a.size()<<endl;
        ll k=b.size();
        string str;
      for(ll i=0;i<a.size();i+=k){
            str=a.substr(i,k);
            //cout<<str<<endl;
            if(str!=b){
                f=1;
                break;
            }
      }
      if(f) cout<<-1<<endl;
      else cout<<a<<endl;
    }
    else{
        ll n=a.size();
        ll m=b.size();
```

```
            ll lcm=LCM(n,m);
            string toadd=b;
            while(b.size()<lcm){
                b+=toadd;
            }
            ll k=a.size();
            string str;
            for(ll i=0;i<b.size();i+=k){
                str=b.substr(i,k);
                //cout<<str<<endl;
                if(str!=a){
                    f=1;
                    break;
                }
            }
            if(f) cout<<-1<<endl;
            else cout<<b<<endl;
        }
    }


    return 0;
}
```

Status:

General

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
189057675	Practice: sefayetalam14	1473B - 20	GNU C++14	Accepted	31 ms	144 KB	2023-01-13 08:03:14	2023-01-13 08:03:14	☆	Compare

Problem-4:

Link: https://codeforces.com/problemset/problem/1474/B

Solution:

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

using namespace std;


#define ll              long long
#define fast ios_base::sync_with_stdio(0);cin.tie(0);cout.tie(0);
#define deb(x) cout << #x << "=" << x << endl
#define deb2(x, y) cout << #x << "=" << x << "," << #y << "=" << y << endl
#define Setpre(n) cout<<fixed<<setprecision(n)
inline ll GCD(ll a, ll b) { return b == 0 ? a : GCD(b, a % b); }
inline ll LCM(ll a, ll b) { return a * b / GCD(a, b); }
inline ll Ceil(ll p, ll q)  {return p < 0 ? p / q : p / q + !!(p % q);}
inline ll Floor(ll p, ll q) {return p > 0 ? p / q : p / q - !!(p % q);}
inline double logb(ll base,ll num){ return (double)log(num)/(double)log(base);}
#define M 10000


inline bool isPerfectSquare(long double x){ if (x >= 0) { long long sr = sqrt(x);return (sr * sr == x); }return false; }
double euclidean_distance(ll x1,ll y1,ll x2,ll y2){double a=(x2-x1)*(x2-x1);double b=(y2-y1)*(y2-y1);double c=(double)sqrt(a+b);return c;}
int popcount(ll x){return __builtin_popcountll(x);};
int poplow(ll x){return __builtin_ctzll(x);};
int pophigh(ll x){return 63 - __builtin_clzll(x);};

ll N=100005;
vector<bool> Primes(N,1);
```

```
vector<ll>primenos;
void SieveOfEratosthenes(int n)
{
    Primes[1]=0;
    for (ll i=2;i*i<=n;i++) {
    if(Primes[i]==1){
    for(ll j=i*i;j<=n;j+=i)
        Primes[j]=0;
        }
    }
    for(ll i=2;i<N;i++){
        if(Primes[i]) primenos.push_back(i);
    }
}

int main()
{
    fast;
     ll t;
    //setIO();
     //ll tno=1;;
     //t=1;
    cin>>t;
    SieveOfEratosthenes(N);
    while(t--){
        ll d;
        cin>>d;
        ll no1=1;
        ll no2;
        ll prev=1;
```

```
    vector<ll>ans;
    for(auto it:primenos){
       if(it-prev>=d){
          // cout<<it<<" ";
           ans.push_back(it);
           prev=it;
       }
      if(ans.size()>3) break;
    }
    //cout<<ans[0]<<" "<<ans[1]<<endl;
    cout<<ans[0]*ans[1]<<endl;



  }


  return 0;
}
```

Status:

General

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
189636705	Practice: sefayetalam14	1474B - 25	GNU C++20 (64)	Accepted	62 ms	300 KB	2023-01-18 15:04:53	2023-01-18 15:04:53	☆	Compare

Problem-5:

Link: https://codeforces.com/problemset/problem/1765/M

Solution:

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

using namespace std;


#define ll                long long
#define Setpre(n) cout<<fixed<<setprecision(n)
inline ll GCD(ll a, ll b) { return b == 0 ? a : GCD(b, a % b); }
inline ll LCM(ll a, ll b) { return a * b / GCD(a, b); }
inline ll Ceil(ll p, ll q)  {return p < 0 ? p / q : p / q + !!(p % q);}
inline ll Floor(ll p, ll q) {return p > 0 ? p / q : p / q - !!(p % q);}
inline double logb(ll base,ll num){ return (double)log(num)/(double)log(base);}
#define M 10000


inline bool isPerfectSquare(long double x){ if (x >= 0) { long long sr = sqrt(x);return (sr * sr == x); }return false; }
double euclidean_distance(ll x1,ll y1,ll x2,ll y2){double a=(x2-x1)*(x2-x1);double b=(y2-y1)*(y2-y1);double c=(double)sqrt(a+b);return c;}
int popcount(ll x){return __builtin_popcountll(x);};
int poplow(ll x){return __builtin_ctzll(x);};
int pophigh(ll x){return 63 - __builtin_clzll(x);};


namespace io{
   template<typename First, typename Second> ostream& operator << ( ostream &os, const pair<First, Second> &p ) { return os << p.first << " " << p.second; }
   template<typename First, typename Second> ostream& operator << ( ostream &os, const map<First, Second> &mp ) { for( auto it : mp ) { os << it << endl;  } return os; }
   template<typename First> ostream& operator << ( ostream &os, const vector<First> &v ) { bool space = false; for( First x : v ) { if( space ) os << " "; space = true; os << x; } return os; }
```

```
template<typename First> ostream& operator << ( ostream &os, const set<First> &st ) { bool space = false; for( First x : st ) { if( space ) os << " "; space = true; os << x; } return os; }

template<typename First> ostream& operator << ( ostream &os, const multiset<First> &st ) { bool space = false; for( First x : st ) { if( space ) os << " "; space = true; os << x; } return os; }


template<typename First, typename Second> istream& operator >> ( istream &is, pair<First, Second> &p ) { return is >> p.first >> p.second; }

template<typename First> istream& operator >> ( istream &is, vector<First> &v ) { for( First &x : v ) { is >> x; } return is; }


long long fastread(){ char c; long long d = 1, x = 0; do c = getchar(); while( c == ' ' || c == '\n' ); if( c == '-' ) c = getchar(), d = -1; while( isdigit( c ) ){ x = x * 10 + c - '0'; c = getchar(); } return d * x; }


static bool sep = false;


using std::to_string;


string to_string( bool x ){ return ( x ? "true" : "false" ); }

string to_string( const string & s ){ return "\"" + s + "\""; }

string to_string( const char * s ){ return "\"" + string( s ) + "\""; }

string to_string ( const char & c ) { string s; s += c; return "\'" + s + "\'"; }


template<typename Type> string to_string( vector<Type> );

template<typename First, typename Second> string to_string( pair<First, Second> );

template<typename Collection> string to_string( Collection );


template<typename First, typename Second> string to_string( pair<First, Second> p ){ return "{" + to_string( p.first ) + ", " + to_string( p.second ) + "}"; }

template<typename Type> string to_string( vector<Type> v ) { bool sep = false; string s = "["; for( Type x: v ){ if( sep ) s += ", "; sep = true; s += to_string( x ); } s += "]"; return s; }
```

```
    template<typename Collection> string to_string( Collection collection ) { bool sep = false; string s = "{"; for( auto x: collection ){ if( sep ) s += ", "; sep = true; s += to_string( x ); } s += "}"; return s; }


    void print() { cerr << endl; sep = false; }

    template <typename First, typename... Other> void print( First first, Other... other ) { if( sep ) cerr << " | "; sep = true; cerr << to_string( first ); print( other... ); }


} using namespace io;

bool prime(ll n)

{

    // As 1 is neither prime

    // nor composite return false

    if (n == 1)

        return false;


    // Check if it is divided by any

    // number then it is not prime,

    // return false

    for (ll i = 2; i * i <= n; i++) {

        if (n % i == 0)

            return false;

    }


    // Check if n is not divided

    // by any number then it is

    // prime and hence return true

    return true;

}


// Function to find the pair (a, b)
```

```
// such that sum is N & LCM is minimum
void minDivisor(ll n)
{

    // Check if the number is prime
    if (prime(n)) {
        cout << 1 << " " << n - 1<<endl;
    }

    // Now, if it is not prime then
    // find the least divisor
    else {
        for (ll i = 2; i * i <= n; i++) {

            // Check if divides n then
            // it is a factor
            if (n % i == 0) {

                // Required output is
                // a = n/i & b = n/i*(n-1)
                cout << n / i <<" "<< n / i * (i - 1)<<endl;
                break;
            }
        }
    }
}
int main()
{
    fast;
     ll t;
```

```
    //setIO();
     //ll tno=1;;
     //t=1;
    cin>>t;

    while(t--){
        ll n;
        cin>>n;
        minDivisor(n);
        //cout<<k<<endl;

    }


    return 0;
}
```

Status:

General

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
193031607	Practice: sefayetalam14	1765M - 12	GNU C++20 (64)	Accepted	62 ms	8 KB	2023-02-10 11:04:21	2023-02-10 11:04:21	☆	Compare

Problem-6:

Link: https://codeforces.com/problemset/problem/1511/B

Solution:

```
#include <bits/stdc++.h>
#define ll long long
#define ghost 0
#define PI 3.1415926535897932385
#define INF 1000111222
#define eps 1e-7
```

```
#define maxN 1011
#define fast ios_base::sync_with_stdio(0);cin.tie(0);cout.tie(0);
using namespace std;

const ll md = 1000000007;
void setIO(){
   #ifndef ONLINE_JUDGE
   freopen("input.txt","r",stdin);
   freopen("output.txt","w",stdout);
   #endif
}
map<string,string> mp;
ll pow1(ll n, ll p)
{
   if (p == 0)
      return 1;
   ll x = pow1(n, p / 2);
   x = (x * x) % md;
   if (p % 2 == 0)
      return x;
   else
      return (x * n) % md;
}


char in[maxN],out[maxN];
int main()
{
   fast;
   setIO();
```

```
    ll t;
    string s;
    cin>>t;
    while(t--)
    {
        ll a,b,c;
            cin>>a>>b>>c;

            ll X = pow(10,c-1);
            ll Y = pow(10,c-1);

            ///make X and Y of a and b digits

            while(X<(ll)pow(10,a-1))
            {
               ///multiply X till it become of a digits
               X*=2;
            }

            while(Y<(ll)pow(10,b-1))
            {
               ///multiply Y till it become of b digits
               Y*=3;
            }

            cout<<X<<" "<<Y<<endl;
    }

    return ghost;
}
```

Status:

General

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
157883511	Practice: sefayetalam14	1511B - 8	GNU C++14	Accepted	0 ms	8 KB	2022-05-21 12:26:13	2022-05-21 12:26:13		Compare

Problem-7:

Link: https://codeforces.com/problemset/problem/1742/D

Solution:

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

using namespace std;


#define ll                long long
#define fast ios_base::sync_with_stdio(0);cin.tie(0);cout.tie(0);
const ll maxN=2e6;
#define M 10000


int main()
{
    fast;
     ll t;
    //setIO();
     //ll tno=1;;
     //t=1;
    cin>>t;
    memset(divs,0,sizeof(divs));
    for(ll i=1;i<1001;i++){
        for(ll j=i+1;j<1001;j++){
            if(__gcd(i,j)==1){
```

```
            divs[i][j]=1;
        }
        else divs[i][j]=0;
    }
}
divs[1][1]=1;
while(t--){
    ll n;
    cin>>n;
    vector<ll>vec(n);
    vector<ll> vis(1001,0);
    for(ll i=0;i<n;i++){
        cin>>vec[i];
        vis[vec[i]]=i+1;
    }

    ll maxm=-1;
    //vector<pair<ll,ll> >ans;
    for(ll i=0;i<1001;i++){
        for(ll j=i;j<1001;j++){
            if((divs[i][j] || divs[j][i]) && vis[i] && vis[j]){

                maxm=max(maxm,vis[i]+vis[j]);
            }
        }
    }
    // for(auto it:ans){
    //     cout<<it.first<<" "<<it.second<<endl;
    // }
    if(maxm==-1){cout<<-1<<endl;}
```

```
        else{

            cout<<maxm<<endl;
        }
    }
    return 0;
}
```

Status:

General

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
190239037	Practice: sefayetalam14	1742D - 36	GNU C++20 (64)	Accepted	93 ms	9448 KB	2023-01-23 20:15:13	2023-01-23 20:15:13		Compare

Problem-8:

Link: https://codeforces.com/problemset/problem/1762/B

Solution:

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

using namespace std;



#define ll                long long
#define Setpre(n) cout<<fixed<<setprecision(n)
inline ll GCD(ll a, ll b) { return b == 0 ? a : GCD(b, a % b); }
inline ll LCM(ll a, ll b) { return a * b / GCD(a, b); }
inline ll Ceil(ll p, ll q)  {return p < 0 ? p / q : p / q + !!(p % q);}
inline ll Floor(ll p, ll q) {return p > 0 ? p / q : p / q - !!(p % q);}
inline double logb(ll base,ll num){ return (double)log(num)/(double)log(base);}
#define M 10000
```

```
inline bool isPerfectSquare(long double x){ if (x >= 0) { long long sr = sqrt(x);return (sr * sr == x); }return false; }

double euclidean_distance(ll x1,ll y1,ll x2,ll y2){double a=(x2-x1)*(x2-x1);double b=(y2-y1)*(y2-y1);double c=(double)sqrt(a+b);return c;}

int popcount(ll x){return __builtin_popcountll(x);};

int poplow(ll x){return __builtin_ctzll(x);};

int pophigh(ll x){return 63 - __builtin_clzll(x);};



namespace io{

   template<typename First, typename Second> ostream& operator << ( ostream &os, const pair<First, Second> &p ) { return os << p.first << " " << p.second; }

   template<typename First, typename Second> ostream& operator << ( ostream &os, const map<First, Second> &mp ) { for( auto it : mp ) { os << it << endl;  } return os; }

   template<typename First> ostream& operator << ( ostream &os, const vector<First> &v ) { bool space = false; for( First x : v ) { if( space ) os << " "; space = true; os << x; } return os; }

   template<typename First> ostream& operator << ( ostream &os, const set<First> &st ) { bool space = false; for( First x : st ) { if( space ) os << " "; space = true; os << x; } return os; }

   template<typename First> ostream& operator << ( ostream &os, const multiset<First> &st ) { bool space = false; for( First x : st ) { if( space ) os << " "; space = true; os << x; } return os; }


   template<typename First, typename Second> istream& operator >> ( istream &is, pair<First, Second> &p ) { return is >> p.first >> p.second; }

   template<typename First> istream& operator >> ( istream &is, vector<First> &v ) { for( First &x : v ) { is >> x; } return is; }


   long long fastread(){ char c; long long d = 1, x = 0; do c = getchar(); while( c == ' ' || c == '\n' ); if( c == '-' ) c = getchar(), d = -1; while( isdigit( c ) ){ x = x * 10 + c - '0'; c = getchar(); } return d * x; }


   static bool sep = false;


   using std::to_string;
```

```
    string to_string( bool x ){ return ( x ? "true" : "false" ); }
    string to_string( const string & s ){ return "\"" + s + "\""; }
    string to_string( const char * s ){ return "\"" + string( s ) + "\""; }
    string to_string ( const char & c ) { string s; s += c; return "\'" + s + "\'"; }

    template<typename Type> string to_string( vector<Type> );
    template<typename First, typename Second> string to_string( pair<First, Second> );
    template<typename Collection> string to_string( Collection );

    template<typename First, typename Second> string to_string( pair<First, Second> p ){ return "{" + to_string( p.first ) + ", " + to_string( p.second ) + "}"; }
    template<typename Type> string to_string( vector<Type> v ) { bool sep = false; string s = "["; for( Type x: v ){ if( sep ) s += ", "; sep = true; s += to_string( x ); } s += "]"; return s; }
    template<typename Collection> string to_string( Collection collection ) { bool sep = false; string s = "{"; for( auto x: collection ){ if( sep ) s += ", "; sep = true; s += to_string( x ); } s += "}"; return s; }

    void print() { cerr << endl; sep = false; }
    template <typename First, typename... Other> void print( First first, Other... other ) { if( sep ) cerr << " | "; sep = true; cerr << to_string( first ); print( other... ); }

} using namespace io;

int main()
{
    fast;
     ll t;
    //setIO();
     //ll tno=1;;
     //t=1;
    cin>>t;
```

```
    while(t--){
        ll n;
        cin>>n;
        vector<ll>vec(n);
        cin>>vec;
        //vasort(vec);
        //cout<<vec<<endl;
        cout<<n<<endl;
        for(ll i=0;i<n;i++){
         ll k=1;
         while(k<=vec[i]){
            k*=2;
         }
         cout<<i+1<<" "<<k-vec[i]<<endl;
        }
    }



    return 0;
}
```

Status:

General

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
192988244	Practice: sefayetalam14	1762B - 36	GNU C++20 (64)	Accepted	296 ms	792 KB	2023-02-09 23:23:39	2023-02-09 23:23:39	☆	Compare

Problem-9:

Link: https://codeforces.com/problemset/problem/1780/B

Solution:

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

using namespace std;



#define ll                long long
#define Setpre(n) cout<<fixed<<setprecision(n)
inline ll GCD(ll a, ll b) { return b == 0 ? a : GCD(b, a % b); }
inline ll LCM(ll a, ll b) { return a * b / GCD(a, b); }
inline ll Ceil(ll p, ll q)  {return p < 0 ? p / q : p / q + !!(p % q);}
inline ll Floor(ll p, ll q) {return p > 0 ? p / q : p / q - !!(p % q);}
inline double logb(ll base,ll num){ return (double)log(num)/(double)log(base);}
#define M 10000



inline bool isPerfectSquare(long double x){ if (x >= 0) { long long sr = sqrt(x);return (sr * sr == x); }return false; }
double euclidean_distance(ll x1,ll y1,ll x2,ll y2){double a=(x2-x1)*(x2-x1);double b=(y2-y1)*(y2-y1);double c=(double)sqrt(a+b);return c;}
int popcount(ll x){return __builtin_popcountll(x);};
int poplow(ll x){return __builtin_ctzll(x);};
int pophigh(ll x){return 63 - __builtin_clzll(x);};
void setIO(){
   #ifndef ONLINE_JUDGE
   freopen("input.txt", "r", stdin);


   freopen("output.txt", "w", stdout);
   #endif // ONLINE_JUDGE


}
int main()
```

```
{
    fast;
     ll t;
    //setIO();
     //ll tno=1;;
     //t=1;
    cin>>t;

    while(t--){
        ll n;
        cin>>n;
        vector<ll>vec(n),pref(n);
        ll tot=0;
        for(ll i=0;i<n;i++){
            cin>>vec[i];
            tot+=vec[i];
        }
        pref[0]=vec[0];
        for(ll i=1;i<n;i++){
            pref[i]=pref[i-1]+vec[i];
        }
        // for(auto it:pref){
        //     cout<<it<<" ";
        // }
        // cout<<endl;
        ll maxm=-1;
        ll Gcd;
        for(ll i=0;i<n-1;i++){

            Gcd=__gcd(pref[i],tot-pref[i]);
```

```
            maxm=max(maxm,Gcd);
          // cout<<pref[i]<<" "<<Gcd<<" "<<tot-pref[i]<<" "<<maxm<<endl;

        }
        cout<<maxm<<endl;
    }


    return 0;
}
```

Status:

General

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
190519011	Contestant: sefayetalam14	1780B - 38	GNU C++20 (64)	Accepted	93 ms	3144 KB	2023-01-25 18:00:16	2023-01-25 19:50:07	☆	Compare

Problem-10:

Link: https://codeforces.com/problemset/problem/1826/C

Solution:

```
#include<bits/stdc++.h>
#include<ext/pb_ds/assoc_container.hpp>
#include<ext/pb_ds/tree_policy.hpp>
using namespace std;
using namespace __gnu_pbds;

//VVI
#define fast ios_base::sync_with_stdio(0);cin.tie(0);cout.tie(0);
#define pb                push_back
#define ll                long long
#define ff first
#define ss second
```

```
#define SZ(a) (int)a.size()
#define UNIQUE(a) (a).erase(unique(all(a)),(a).end())
#define eb emplace_back
#define mp make_pair


///BIT MANIPULATION

#define Set(x, k) (x |= (1LL << k))
#define Unset(x, k) (x &= ~(1LL << k))
#define Check(x, k) (x & (1LL << k))
#define Toggle(x, k) (x ^ (1LL << k))

//LOOPS

#define scl(n)            scanf("%lld", &n)
#define fr(i,n)           for (ll i=0;i<n;i++)
#define fr1(i,n)          for(ll i=1;i<=n;i++)
#define Fo(i,k,n) for(i=k;k<n?i<n:i>n;k<n?i+=1:i-=1)

///PRINTING

#define deb(x) cout << #x << "=" << x << endl
#define deb2(x, y) cout << #x << "=" << x << "," << #y << "=" << y << endl
#define nn '\n'
#define pfl(x)            printf("%lld\n",x)
#define pcas(i)              printf("Case %lld: ",i)
#define Setpre(n) cout<<fixed<<setprecision(n)
#define itr(it, a) for(auto it = a.begin(); it != a.end(); it++)
#define debug             printf("I am here\n")
```

```
//CONSTANTS
#define md                10000007
#define PI 3.14159265358979323846
const double EPS = 1e-9;
const ll N = 1e6+10;
const ll M = 1e9+7;


///INLINE FUNCTIONS
inline ll GCD(ll a, ll b) { return b == 0 ? a : GCD(b, a % b); }
inline ll LCM(ll a, ll b) { return a * b / GCD(a, b); }
inline ll Ceil(ll p, ll q)  {return p < 0 ? p / q : p / q + !!(p % q);}
inline ll Floor(ll p, ll q) {return p > 0 ? p / q : p / q - !!(p % q);}
inline double logb(ll base,ll num){ return (double)log(num)/(double)log(base);}
inline bool isPerfectSquare(long double x){ if (x >= 0) { long long sr = sqrt(x);return (sr * sr == x); }return false; }
double euclidean_distance(ll x1,ll y1,ll x2,ll y2){double a=(x2-x1)*(x2-x1);double b=(y2-y1)*(y2-y1);double c=(double)sqrt(a+b);return c;}
int popcount(ll x){return __builtin_popcountll(x);};
int poplow(ll x){return __builtin_ctzll(x);};
int pophigh(ll x){return 63 - __builtin_clzll(x);};


/// Data structures
typedef unsigned long long ull;
typedef pair<ll, ll>    pll;
typedef vector<ll>      vl;
typedef vector<pll>     vpll;
typedef vector<vl>      vvl;
template <typename T> using PQ = priority_queue<T>;
```

```
template <typename T> using QP = priority_queue<T,vector<T>,greater<T>>;


template <typename T> using ordered_set = tree<T, null_type, less<T>, rb_tree_tag,
tree_order_statistics_node_update>;

template <typename T,typename R> using ordered_map = tree<T, R , less<T>, rb_tree_tag,
tree_order_statistics_node_update>;

;



namespace io{

   template<typename First, typename Second> ostream& operator << ( ostream &os, const
pair<First, Second> &p ) { return os << p.first << " " << p.second; }

   template<typename First, typename Second> ostream& operator << ( ostream &os, const
map<First, Second> &mp ) { for( auto it : mp ) { os << it << endl;  } return os; }

   template<typename First> ostream& operator << ( ostream &os, const vector<First> &v )
{ bool space = false; for( First x : v ) { if( space ) os << " "; space = true; os << x; } return os;
}

   template<typename First> ostream& operator << ( ostream &os, const set<First> &st ) {
bool space = false; for( First x : st ) { if( space ) os << " "; space = true; os << x; } return os; }

   template<typename First> ostream& operator << ( ostream &os, const multiset<First> &st
) { bool space = false; for( First x : st ) { if( space ) os << " "; space = true; os << x; } return
os; }


   template<typename First, typename Second> istream& operator >> ( istream &is,
pair<First, Second> &p ) { return is >> p.first >> p.second; }

   template<typename First> istream& operator >> ( istream &is, vector<First> &v ) { for(
First &x : v ) { is >> x; } return is; }


   long long fastread(){ char c; long long d = 1, x = 0; do c = getchar(); while( c == ' ' || c ==
'\n' ); if( c == '-' ) c = getchar(), d = -1; while( isdigit( c ) ){ x = x * 10 + c - '0'; c = getchar();
} return d * x; }


   static bool sep = false;


   using std::to_string;
```

```
    string to_string( bool x ){ return ( x ? "true" : "false" ); }
    string to_string( const string & s ){ return "\"" + s + "\""; }
    string to_string( const char * s ){ return "\"" + string( s ) + "\""; }
    string to_string ( const char & c ) { string s; s += c; return "\'" + s + "\'"; }

    template<typename Type> string to_string( vector<Type> );
    template<typename First, typename Second> string to_string( pair<First, Second> );
    template<typename Collection> string to_string( Collection );

    template<typename First, typename Second> string to_string( pair<First, Second> p ){ return "{" + to_string( p.first ) + ", " + to_string( p.second ) + "}"; }
    template<typename Type> string to_string( vector<Type> v ) { bool sep = false; string s = "["; for( Type x: v ){ if( sep ) s += ", "; sep = true; s += to_string( x ); } s += "]"; return s; }
    template<typename Collection> string to_string( Collection collection ) { bool sep = false; string s = "{"; for( auto x: collection ){ if( sep ) s += ", "; sep = true; s += to_string( x ); } s += "}"; return s; }

    void print() { cerr << endl; sep = false; }
    template <typename First, typename... Other> void print( First first, Other... other ) { if( sep ) cerr << " | "; sep = true; cerr << to_string( first ); print( other... ); }

} using namespace io;
vector<int> smallest_factor;
vector<bool> prime;
vector<int> primes;

void sieve(int maximum) {
    maximum = max(maximum, 2);
    smallest_factor.assign(maximum + 1, 0);
    prime.assign(maximum + 1, true);
    prime[0] = prime[1] = false;
```

```
    primes = {2};

    for (int p = 2; p <= maximum; p += 2) {
        prime[p] = p == 2;
        smallest_factor[p] = 2;
    }

    for (int p = 3; p * p <= maximum; p += 2)
        if (prime[p])
            for (int i = p * p; i <= maximum; i += 2 * p)
                if (prime[i]) {
                    prime[i] = false;
                    smallest_factor[i] = p;
                }

    for (int p = 3; p <= maximum; p += 2)
        if (prime[p]) {
            smallest_factor[p] = p;
            primes.push_back(p);
        }
}
int main()
{
    fast;
     ll t;
    //setIO();
     //ll tno=1;;
    sieve(N);
     t=1;
    cin>>t;
```

```
  while(t--){
    ll n,m;
    cin>>n>>m;
    if(n==1 || m==1) cout<<"YES"<<nn;
    else if(m>=n) cout<<"NO"<<nn;
    else{
      ll k=smallest_factor[n];
      if(k>m) cout<<"YES"<<nn;
      else cout<<"NO"<<nn;
    }
  }


  return 0;
}
```

Status:

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
204720923	Practice: sefayetalam14	1826C - 23	GNU C++20 (64)	Accepted	46 ms	5112 KB	2023-05-06 12:58:28	2023-05-06 12:58:28		Compare