```cpp
#include <bits/stdc++.h>
using namespace std;
typedef long long LL;
typedef long double LD;
typedef vector<int> VI;
typedef vector<LL> VLL;
typedef vector<double> VD;

#define rep(i,n) for(int i=0;i<(n);i++)
#define repab(i,a,b) for(int i=(a);i<=(b);i++)
#define all(v) v.begin(),v.end()
#define pb push_back
#define PI 3.14159265358979323846264338327950288419 7

vector<string> split(string S, string D)
{
    vector<string> ar;
    int pos = 0, last = 0;
    while( (pos = S.find(D,last)) != string::npos)
    {
        string sub = S.substr(last,pos-last);
        if(sub.length() > 0)
            ar.push_back(sub);
        last = pos + D.length();
    }
    string sub = S.substr(last);
    if(sub.length() > 0)
        ar.push_back(sub);
    return ar;
}

inline LL pow(LL b, LL e)
{
    LL ans=1;
    while(e--) ans *= b;
    return ans;
}

inline LL pow(LL b, LL e, LL mod)
{
    LL ans=1;
    while(e)
    {
        if(e & 1)
            ans = ans * b % mod;
        b = b * b % mod;
        e >>= 1;
    }
    return ans;
}

template<class T>
T egcd(T a, T b, T &x, T &y)
```

```
{
    if (a == 0)
    {
        x = 0;
        y = 1;
        return b;
    }
    T x1, y1;
    T d = egcd(b%a, a, x1, y1);
    x = y1 - x1* (b/a);
    y = x1;
    return d;
}

LL inv(LL a, LL m)
{
    LL inv,y;
    assert(egcd(a,m,inv,y) == 1);
    if(inv < 0) inv += m;
    return inv;
}

inline LL gcd(LL a, LL b)
{
    while(b)
    {
        LL t = b;
        b = a%b;
        a = t;
    }
    return a;
}
```