```cpp
const int max_primes = 1000001;     // 1e6+1
int pdiv[max_primes];

void sieve()
{
    memset(pdiv,0,sizeof(pdiv));
    for(int a=2;a*a<max_primes;a++)
    {
        if(pdiv[a]) continue;
        pdiv[a] = a;
        for(int b=a*a;b<max_primes;b+=a)
            pdiv[b] = a;
    }
    for(int a=2;a<max_primes;a++)
        if(pdiv[a] == 0) pdiv[a] = a;
}

vector< pair<int,int> > getprimefactors(int n)
{
    vector< pair<int,int> > v;
    int L;
    while( (L=pdiv[n]) > 0)
    {
        int count = 0;
        while(n % L == 0)
        {
            n /= L; count++;
        }
        v.push_back({L,count});
    }
    return v;
}

int calcphi(int n)
{
    int L;
    LL p = n;
    while( (L=largestpdiv[n]) > 0)
    {
        p = p / L * (L-1);
        while(n % L == 0)
            n /= L;
    }
    return p;
}
```