```cpp
const int MAXN = 10000010;
int pr[MAXN];
int divisor[MAXN];
int phi[MAXN];

void sieve(int n) {
    FOR0(i,n+1) pr[i] = true;
    pr[0] = pr[1] = false;
    for(int i=2; i*i<=n; ++i) {
        if(!pr[i]) continue;
        int k = i*i;
        while(k<=n) {
            divisor[k] = i;
            pr[k] = false;
            k += i;
        }
    }
}

void calc phi(int n) {
    FOR(i,1,n+1) phi[i] = i;
    FOR(i,2,n+1) if(pr[i]) {
        for(int j=i; j<=n; j+=i) {
            phi[j] -= phi[j]/i;
        }
    }
}

inline int get div(int n) {
    if(pr[n]) return n;
    return divisor[n];
}

int factorize(int v[], int n) {
    if(n<=1) return 0;
    int sz=0;
    while(n>1) {
        int p = get div(n);
        v[sz++] = p;
        n/=p;
    }
    return sz;
}

```