Contents

1   Add
1.1   CRT [1a7c6e]

```cpp
// a * p.first + b * p.second = gcd(a, b)
pair<ll, ll> exgcd(ll a, ll b) {
    if (b == 0) return {1, 0};
    auto [y, x] = exgcd(b, a % b);
    return {x, y - (a / b) * x};
}
// smallest non-negative solution
using i128 = __int128_t;
pair<ll, ll> CRT(ll r1, ll m1, ll r2, ll m2) {
    ll g = __gcd(m1, m2);
    if ((r2 - r1) % g) return {-1, g};
    m1 /= g, m2 /= g;
    auto [p1, p2] = exgcd(m1, m2);
    i128 lcm = i128(m1) * m2 * g;
    i128 res = i128(p1) * (r2 - r1) * m1 + r1;
    return {(res % lcm + lcm) % lcm, lcm};
}
ll EXCRT(vector<pair<ll, ll>> a) {
    ll R = 0, M = 1;
    for (auto [r, m] : a) {
        auto [res, lcm] = CRT(R, M, r, m);
        if (res == -1) return -1;
        R = res, M = lcm;
    }
    return R;
}
```