Notebook - Maratona de Programação

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Contents

1 EDs

1.1 Ordered Set

```cpp
#include <bits/extc++.h>

using namespace __gnu_pbds; // or pb_ds;

template<typename T, typename B = null_type>
using ordered_set = tree<T, B, less<T>, rb_tree_tag, tree_order_statistics_node_update>; // order_of_key (k) : Number of items strictly smaller than k.
// find_by_order(k) : K-th element in a set (counting from zero).
```

1.2 Dsu

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

#define endl "\n"
#define pb push_back
#define ll long long
#define vi vector<int>

using namespace std;

const double PI = acos(-1);
typedef pair<int,int> pii;

class DSU
{
    vector<int> parent;
    vector<int> card;

public:
    DSU(int n): parent(n+1), card(n+1,1)
    {
        for(int i = 1; i <= n; i++)
            parent[i] = i;
    }

    /* O(log n) */
    int find_set(int x)
    {
        if(x == parent[x])
            return x;

        return parent[x] = find_set(parent[x]);
    }

    bool same_set(int a, int b)
    {
        return find_set(a) == find_set(b);
    }

    /* O(log n) */
    void join_sets(int a, int b)
    {
        a = find_set(a);
        b = find_set(b);

        if(card[a] < card[b])
            swap(a,b);

        card[a] += card[b];
        parent[b] = a;
    }
};

int main(){

    // Cria 5 conjuntos contendo 1 elemento cada: {1}, {2}, {3}, {4} e {5}
    DSU conj(5);
}
```