CPA Cache Reference Sheet

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2. graphs

2.1 Disjoint Set Union Some information about disjoint set unions

```
struct DSU {
    vector<int> e;

    void init(int n) {
        e = vector<int>(n, -1);
    }

    int find(int x) {
        return (e[x] < 0 ? x : e[x] = find(e[x]));
    }

    bool unite(int a, int b) {
        a = find(a);
        b = find(b);

        if (a == b) {
            return false;
        }

        if (e[a] > e[b]) {
            swap(a, b);
        }

        e[a] += e[b];
        e[b] = a;

        return true;
    }

    int size(int x) {
        return -e[find(x)];
    }

    bool is_same(int a, int b) {
        return find(a) == find(b);
    }
};
```

3. range

3.1 Segment Tree This is a segment tree

```
struct SegTree {
    int a;
};
```