# Union Find

## 视频讲解：<https://www.youtube.com/watch?v=VJnUwsE4fWA&list=PLLuMmzMTgVK5Hy1qcWYZcd7wVQQ1v0AjX&index=1>



Find(x): find the root/cluster-id of x

Union(x, y): merge two clusters

Check whether two elements are in the same set or not in O(1)\*.

Find: O(ɑ(n))\* ≈ O(1)

Union: O(ɑ(n))\* ≈ O(1)

Space: O(n)

Without optimization: Find: O(n)

Two key optimizations:

1. Path compression: make tree flat
2. Union by rank: merge low rank tree to high rank one

\*: amortized

ɑ(.): inverse Ackermann function





Implementation:

