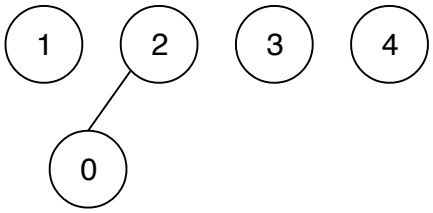
Union Find

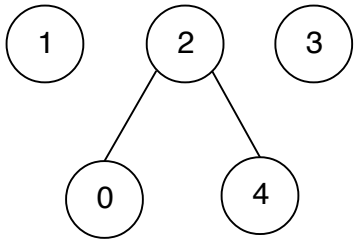
a) Initial

0	1	2	3	4



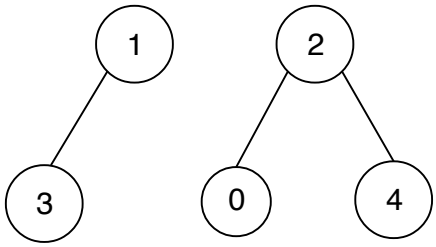
b) Union(0, 2)

2	1	2	3	4



c) Union(4, 2)

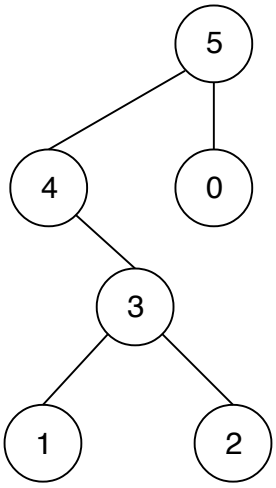
2	1	2	3	2



d) Union(3, 1)

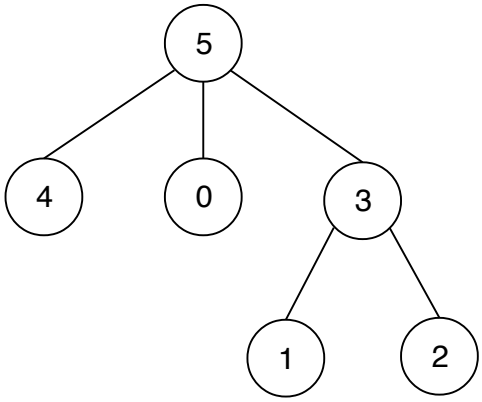
2	1	2	1	2

Path Compression



a) initial

5	3	3	4	5	5



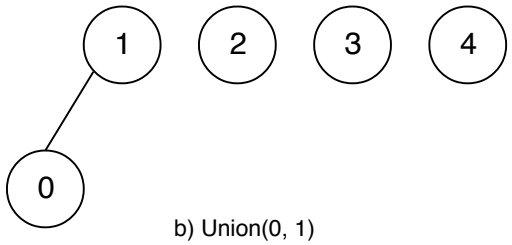
b) Find(3)

5	3	3	5	5	5

Naive Union

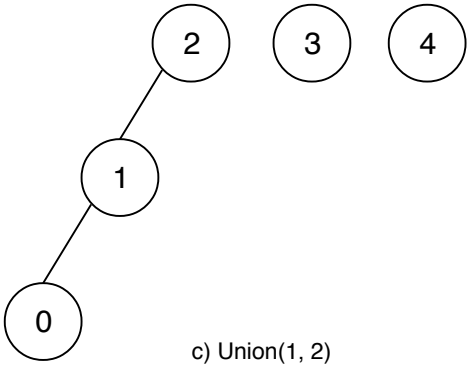
a) Initial

0	1	2	3	4



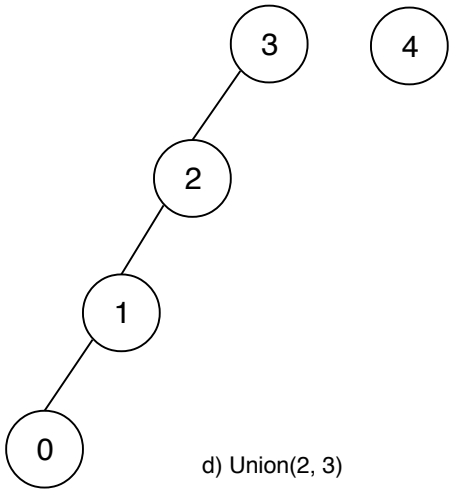
b) Union(0, 1)

1	1	2	3	4



c) Union(1, 2)

1	2	2	3	4



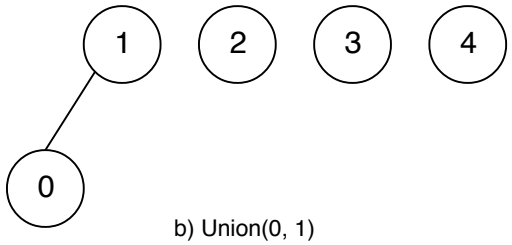
d) Union(2, 3)

1	2	3	3	4

Union by Rank

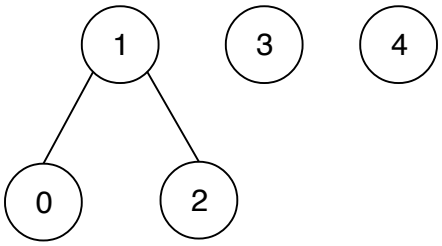
a) Initial

parents	0	1	2	3	4
rank	0	0	0	0	0



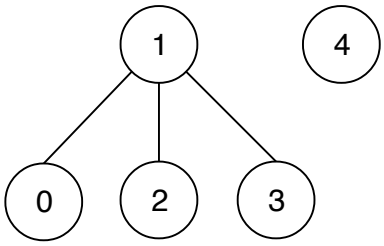
b) Union(0, 1)

parents	1	1	2	3	4
rank	0	1	0	0	0



c) Union(1, 2)

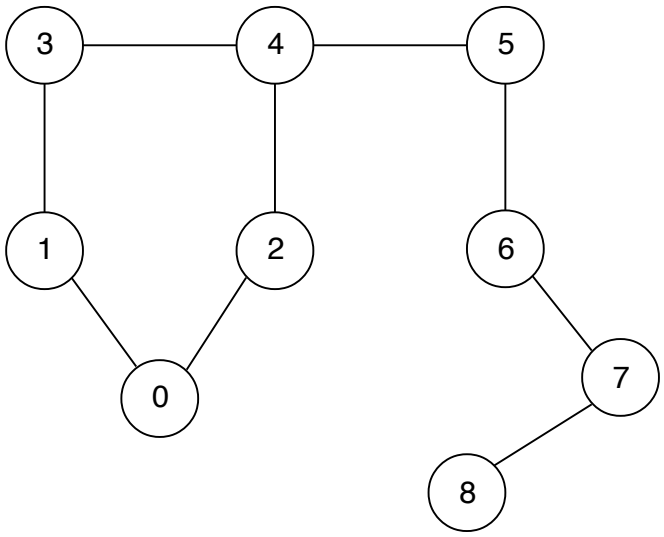
parents	1	1	1	3	4
rank	0	1	0	0	0



d) Union(2, 3)

parents	1	1	1	1	4
rank	0	1	0	0	0

Graph contains Cycle



Graph does not contain Cycle