



## **Disjoint Sets**

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# Learning Objectives

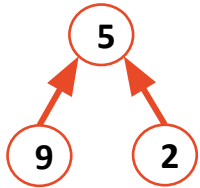
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1. Draw Uptrees as Arrays
2. Understand how to union sets by size
3. Understand how to union sets by height



# UpTree Representation

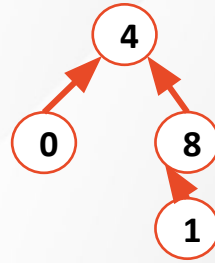
2 5 9



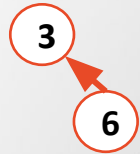
7



0 1 4 8



3 6



0	1	2	3	4	5	6	7	8	9

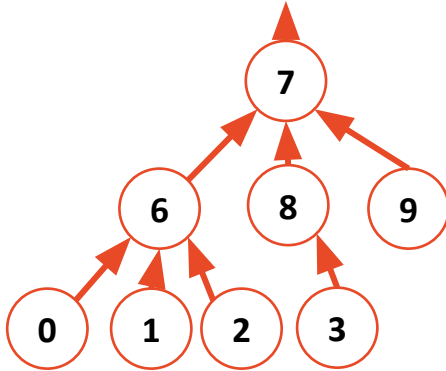
```
1 int DisjointSets::find(int i) {  
2     if ( data[i] < 0 ) { return i; }  
3     else { return find( data[i] ); }  
4 }
```

Running time?

What is the ideal UpTree?



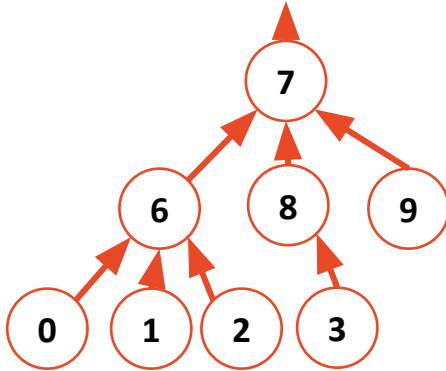
# Union by Size



0	1	2	3	4	5	6	7	8	9	10	11
6	6	6	8	-1	10	7	-1	7	7	4	5



# Union by Height



0	1	2	3	4	5	6	7	8	9	10	11
6	6	6	8	-1	10	7	-1	7	7	4	5

