

# Assignment 5

5. Union(8,9)

8	9
9	-2

⑨ ← ⑧

Union(6,11)

6	8	9	11
11	9	-2	-2

⑨ ← ⑧    ⑩ ← ⑥

Union(4,6)

4	6	8	9	11
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⑨ ← ⑧    ⑩ ← ⑥ ← ④

6	11	9	-2	-3
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Union(1,9)

1	4	6	8	9	11
---	---	---	---	---	----

① → ⑨ ← ⑧    ⑩ ← ⑥ ← ④

9	6	11	9	-2	-3
---	---	----	---	----	----

Union(1,12)

1	4	6	8	9	11	12
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⑩ ← ⑥ ← ④    ① ← ⑨ ← ⑧    ⑩ ← ⑥ ← ④

9	6	11	9	-2	-3	-3
---	---	----	---	----	----	----

①

Union(1,2)

1	2	4	6	8	9	11	12
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② ← ① ← ⑨ ← ⑧    ⑩ ← ⑥ ← ④

9	-4	6	11	9	12	-3	2
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①

Union(11,0)

0	1	2	4	6	8	9	11	12
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② ← ① ← ⑨ ← ⑧    ⑩ ← ⑥ ← ④    ① ← ⑨ ← ⑧

-4	9	-4	6	11	9	12	0	2
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①

Union(7,0)

0	1	2	4	6	7	8	9	11	12
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② ← ① ← ⑨ ← ⑧    ⑩ ← ⑥ ← ④    ① ← ⑨ ← ⑧

-4	9	-4	6	11	0	9	12	0	2
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①

⑦

Union(8,12)

0	1	2	4	6	7	8	9	11	12
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② ← ① ← ⑨ ← ⑧    ⑩ ← ⑥ ← ④    ① ← ⑨ ← ⑧

-4	9	-4	6	11	0	9	12	0	2
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①

⑦

Union(3,5)

0	1	2	3	4	5	6	7	8	9	11	12
-4	9	-4	-2	6	3	11	0	9	12	0	2

② ← ① ← ⑨ ← ⑧    ⑩ ← ⑥ ← ④    ① ← ⑨ ← ⑧

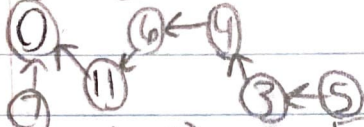
③ ← ⑤    ①    ④

⑨ ← ⑦    ⑥

union(3,4) 8

2 ← 12 ← 9 ← 1

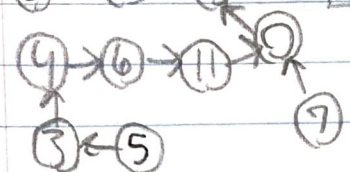
0	1	2	3	4	5	6	7	8	9	11	12
-6	9	-4	4	6	3	11	0	9	12	0	2



union(7,9) 8

2 ← 12 ← 9 ← 1

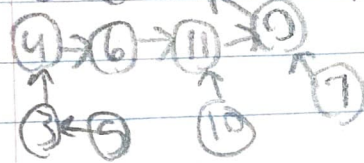
0	1	2	3	4	5	6	7	8	9	11	12
9	9	-9	4	6	3	11	0	9	12	0	2



union(10,11) 8

2 ← 12 ← 9 ← 1

0	1	2	3	4	5	6	7	8	9	10	11	12
9	9	-9	4	6	3	11	0	9	12	11	0	2



find(5) = 2

0	1	2	3	4	5	6	7	8	9	10	11	12
2	9	-3	2	2	2	2	0	9	2	11	2	2

