

1.5: Case Study: Union-find

Exercise 1. Show the contents of the `id[]` array and the number of times the array is accessed for each input pair when you use quick-find for the sequence

9-0 3-4 5-8 7-2 2-1 5-7 0-3 4-2

Solution.

		id[]									
p	q	0	1	2	3	4	5	6	7	8	9
9	0	0	1	2	3	4	5	6	7	8	9
		0	1	2	3	4	5	6	7	8	0
3	4	0	1	2	3	4	5	6	7	8	0
		0	1	2	4	4	5	6	7	8	0
5	8	0	1	2	4	4	5	6	7	8	0
		0	1	2	4	4	8	6	7	8	0
7	2	0	1	2	4	4	8	6	7	8	0
		0	1	2	4	4	8	6	2	8	0
2	1	0	1	2	4	4	8	6	2	8	0
		0	1	1	4	4	8	6	1	8	0
5	7	0	1	1	4	4	8	6	1	8	0
		0	1	1	4	4	1	6	1	1	0
0	3	0	1	1	4	4	1	6	1	1	0
		4	1	1	4	4	1	6	1	1	4
4	2	4	1	1	4	4	1	6	1	1	4
		1	1	1	1	1	1	6	1	1	1

Exercise 7. Develop classes `QuickUnionUF` and `QuickFindUF` that implement quick-union and quick-find, respectively.

Solution. See the `com.segarciat.algs.ch1.sec5.ex07` package.

References

- [SW11] Robert Sedgewick and Kevin Wayne. *Algorithms*. 4th ed. Addison-Wesley, 2011.
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