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Program Structures & Algorithms, Spring 2021  
Assignment No 4  
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#### Task:

1. For weighted quick union, store the depth rather than the size.
2. For weighted quick union with path compression, do two loops, so that all intermediate nodes point to the root, not just the alternates.
3. For both of these, code the alternative and benchmark it against the implementation in the repository. You have all of that available from a previous assignment.

#### Output:

Step 1. After implementing depth p.1 it is obvious that tracking depth adds additional layer. Moreover it each branch might should be measure separately. And there are no obvious benefits.

Implemented in:

```
edu.neu.coe.info6205.union_find.UF_HWQUPC
```

Step 2. Implemented in the same class:

```
edu.neu.coe.info6205.union_find.UF_HWQUPC
```

Step 3. Benchmarks

Number of bins	WQU	w/ PC	w/o PC
10	0.07	0.02	0
100	0.05	0.1	0.03
200	0.03	0.23	0.05
1000	0.34	0.31	0.23
5000	1.08	1.41	1.14
10000	1.63	3.1	2.32
20000	5.11	7.29	5.49
30000	7.62	11.47	8.84
100000	22.03	54.1	35.48
500000	178.91	722.02	318.62

