

2013 THOROUGHBRED

If you have ever gazed in admiration at the sleek plumage, scintillating eye or effulgent beak of a top competitor from that endlessly diverting world of pigeon racing, you might perhaps have delved into the lineage of your favourite bird. Thoroughbred birds are recorded in detailed stud books, which record a bird's ancestors.

Two formats of record-keeping are in common usage these days, the *modern* and *antient*. The former records a pigeon by its name, followed by the record of its mother and then that of its father. The latter records a pigeon by the record of its mother, the pigeon's name and then that of the father. Where the mother or father is lost to antiquity, or too shameful to record, that part of the record is left blank.

For example, suppose that birds named 9_F and 6_M (whose parents are not known) have an offspring whose name is 8_M ; F and M here denote male and female. The *modern* record of this bird would be $8_M 9_F 6_M$ and the *antient* record would be $9_F 8_M 6_M$. If this bird had an offspring named 1_M whose other parent is unknown, the records would be $1_M 8_M 9_F 6_M$ and $1_M 9_F 8_M 6_M$ respectively.

Breeding is carefully controlled and no bird is allowed to have more than one offspring. The two formats continue to exist side-by-side, if uneasily, as given both the *modern* and *antient* records for a bird it is possible to deduce that bird's lineage.

Write a program that reads the two records for a single bird and determines the bird's lineage. The first line of input will contain a single integer, n ($1 \leq n \leq 2^{20}$) indicating the number of names in each record; names will be unique integers from 1 to n . The second line will contain n integers, the *modern* record for the bird. The third line will contain n integers, the *antient* record for the bird.

You should output n lines, each containing a single integer. The integer on the i^{th} line indicates the offspring of the bird with name i . If bird i has no offspring you should output 0.

SAMPLE INPUT

```
9
7 3 4 1 8 9 6 5 2
4 3 1 9 8 6 7 5 2
```

SAMPLE OUTPUT

```
3
5
7
3
7
8
0
1
8
```