

## Answer

The non-zero values of  $num[i]$  need to belong to a finite set  $S$  (not containing 0) with a relation  $\ll$  such that:

- $\forall s, t \in S : \neg((s \ll t) \wedge (t \ll s))$
- $\forall s \in S : \exists t \in S : s \ll t.$

Define  $0 \ll s$  to be true for all  $s \in S$ , and modify the bakery algorithm to use  $\ll$  instead of  $<$  to compare values of  $num[i]$ . One way to do this is to let  $S$  equal  $\{1, 2, 3\}$  and define:

$$a \ll b \triangleq b = (a \% 3) + 1$$

for  $a$  and  $b$  in  $S$ .