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1 |----- MODULE Consensus -----|
2 | EXTENDS Sets, TLAPS |
3 |-----|
4 | CONSTANT Value  the set of values that can be chosen
5 | VARIABLE chosen the set of values that have been chosen
6 |-----|
7 | Init  $\triangleq$  chosen = {}
8 | Next  $\triangleq$ 
9 |    $\wedge$  chosen = {}
10 |    $\wedge \exists v \in \textit{Value} : \textit{chosen}' = \{v\}$ 
11 |
12 | Spec  $\triangleq$  Init  $\wedge \Box[\textit{Next}]_{\textit{chosen}}$ 
13 |-----|
14 | Inv  $\triangleq$ 
15 |    $\wedge \textit{chosen} \subseteq \textit{Value}$ 
16 |    $\wedge \textit{IsFiniteSet}(\textit{chosen})$ 
17 |    $\wedge \textit{Cardinality}(\textit{chosen}) \leq 1$ 
18 |-----|
19 | THEOREM Invariance  $\triangleq$  Spec  $\Rightarrow \Box \textit{Inv}$ 
20 | <1>1 Init  $\Rightarrow$  Inv
21 |   BY CardinalityZero, SMTDEFS Init, Inv
22 | <1>2. Inv  $\wedge [\textit{Next}]_{\textit{chosen}} \Rightarrow \textit{Inv}'$ 
23 |   BY CardinalityOne, SMTDEFS Next, Inv
24 | <1>3 QED
25 |   PROOF BY <1>1, <1>2, PTL DEF Spec
26 |-----|

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