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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 |
9 | Next  $\triangleq$ 
10 |    $\wedge$  chosen = {}
11 |    $\wedge \exists v \in \textit{Value} : \textit{chosen}' = \{v\}$ 
12 |
13 | Spec  $\triangleq$  Init  $\wedge \Box[\textit{Next}]_{\textit{chosen}}$ 
14 |-----|
15 | Inv  $\triangleq$ 
16 |    $\wedge \textit{chosen} \subseteq \textit{Value}$ 
17 |    $\wedge \textit{IsFiniteSet}(\textit{chosen})$ 
18 |    $\wedge \textit{Cardinality}(\textit{chosen}) \leq 1$ 
19 |-----|
20 | THEOREM Invariance  $\triangleq$  Spec  $\Rightarrow \Box \textit{Inv}$ 
21 | <1>1. Init  $\Rightarrow \textit{Inv}$ 
22 |   BY CardinalityZero, SMT DEF Init, Inv
23 | <1>2. Inv  $\wedge [\textit{Next}]_{\textit{chosen}} \Rightarrow \textit{Inv}'$ 
24 |   BY CardinalityOne, SMT DEF Next, Inv
25 | <1>3. QED
26 |   BY <1>1, <1>2, PTL DEF Spec
27 |-----|

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