MODULE *SerializabilityD*

Delay the *Serializability* spec by one state to simplify refinement

EXTENDS *Serializability*

CONSTANT *NULL*

ASSUME $T0 \notin Tr$

$Initialized \triangleq fate \neq NULL$

$$
\begin{aligned}
InitD \triangleq\ & \land tr = T0 \\
& \land op = \text{“r”} \\
& \land arg \in Obj \\
& \land rval = Vinit \\
& \land tstate = [t \in Tr \mapsto Open] \\
& \land fate = NULL \\
& \land to = NULL \\
& \land benv = NULL \\
& \land tenv = NULL \\
& \land ff \in \{Flip, Flop\}
\end{aligned}
$$

$$
\begin{aligned}
Predict \triangleq\ & \text{LET } CTs \triangleq \{t \in Tr : fate'[t] = Committed\} \text{ IN} \\
& \land \neg Initialized \\
& \land fate' \in [Tr \to \{Committed, Aborted\}] \\
& \land to' \in Orderings(CTs) \\
& \land benv' \in [1 \,..\, Cardinality(CTs) + 1 \to [Obj \to Val]] \\
& \land tenv' \in \{f \in [CTs \to [Obj \to Val]] : \forall\, t \in CTs : f[t] = benv'[Ord(t)']\} \\
& \land \text{UNCHANGED } \langle tr, op, arg, rval, tstate, ff \rangle
\end{aligned}
$$

$$
\begin{aligned}
NextD \triangleq\ & \lor Predict \\
& \lor (Initialized \land Next)
\end{aligned}
$$

Note: excluding liveness for now

$SpecD \triangleq InitD \land \Box[NextD]_v$