

1. Give an example of a finite topological space in which neither axiom B nor 5 is valid.
2. The initial wording of this problem was incorrect, and this problem has been removed from the homework assignment. The correct wording would be as follows.  
Give an example of a topological space and an interpretation for which axiom B holds, but axiom 5 does not. (Hint: there exists a topological space with just three elements that satisfies this property.)
3. In class, we derived  $\Box\Diamond P \rightarrow \Box\Diamond\Box\Diamond P$  from S4. Derive  $\Box\Diamond\Box\Diamond P \rightarrow \Box\Diamond P$  from S4. This will complete the proof that in S4,  $\Box\Diamond P \leftrightarrow \Box\Diamond\Box\Diamond P$ .