****
Homework
****

1. Come up with the spec for readSentinel that says that r is a head of the stack.
2. Write the proof outline for pop, without looking into lecture notes.
3. Specify and verify the snapshot algorithm given bellow.

$$\begin{aligned}\mathsf{snapshot}() : A * A = {} & (vx, tx_1) \leftarrow !x; \\ & vy \leftarrow !y; \\ & (\_, tx_2) \leftarrow !x; \\ & \mathsf{if}\ tx_1 == tx_2\ \mathsf{then}\ \mathsf{return}\ (vx, vy)\ \mathsf{else}\ \mathsf{snapshot}()\end{aligned}$$

Snapshot operates over the data structure consisting of two pointers x and y, which can be independently changed by concurrent threads. Snapshot returns the values of x and y, but makes sure that the returned values actually resided in the memory *together*, and have not been changed by interfering threads in the middle of the snapshoting. Snapshot recognizes such situations by keeping a timestamp with x, which is incremented upon every modification of x. It then sandwiches the read of y in between two reads of x. If the two obtained timestamps of x are equal, the read values of x and y resided in memory together, and can be returned.