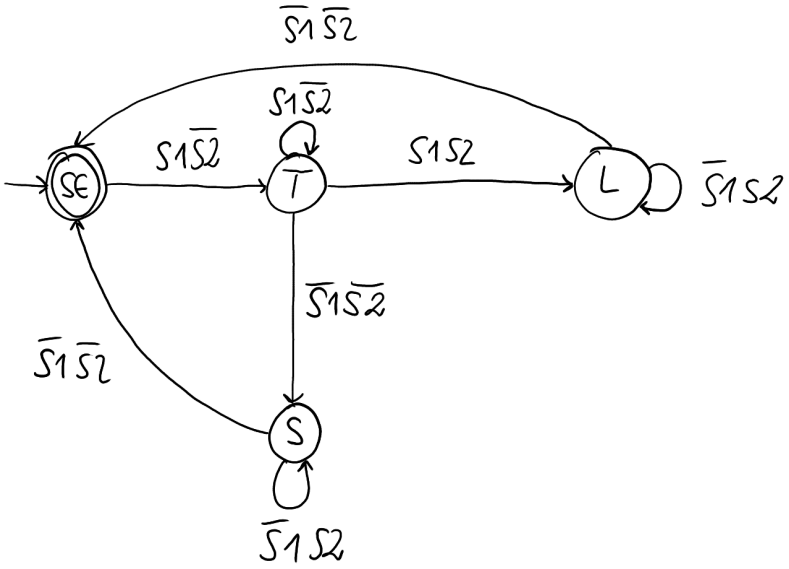
Solutions: Finite State Machine

Task 1



States:

- SE: Starting and end-state
- T: Temporary states where the package is while the machine doesn't know if it's large or small
- L: State for the large packages
- S: State for the small packages

Transition:

- $\mathrm{S1}$: Sensor 1 is blocked
- $\mathrm{S2}$: Sensor 2 is blocked
- $\overline{\mathrm{S1}}$: Sensor 1 is not blocked
- $\overline{\mathrm{S2}}$: Sensor 2 is not blocked

Explanation:

The finite state machine starts in the SE state. A packet of any size always blocks sensor 1 first but not sensor 2, which is it takes you to the next state T. As long as the automaton is in state T it is unclear which size the packet has. Here one of scenarios can occur:

1. If the packet blocks sensor 1 and sensor 2 at the same time, it is always a large packet and so the automat goes from T to L. The machine remains in L as long as the packet does not block both sensors any more.

2. If a packet does not block sensor 2 after crossing sensor 1, it means that it fits between the sensors and is therefore small. Thus it goes into the state S.

In both scenarios, only after sensor 2 has been crossed is it returned to the initial and final state. Here it either starts again from the beginning with a new packet or the automat ends when no more packets arrive.