Exercise 1: Rectangular automaton

Consider the following initialized rectangular automaton $\mathcal{A}$:

(a) Construct an initialized singular automaton $\mathcal{A}_1$ which is equivalent to $\mathcal{A}$, i.e. $\mathcal{A}$ and $\mathcal{A}_1$ accept the same language.

(b) Construct an initialized stopwatch automaton $\mathcal{A}_2$ which is equivalent to $\mathcal{A}_1$.

(c) Construct a timed automaton $\mathcal{A}_3$ which is equivalent to $\mathcal{A}_2$. (Note that we can only reset clocks to zero in a timed automaton.)