

CSC236 winter 2020, quiz week 12₂

first/given name:

last/family name:

utorid:

Recall the language $\text{BOOKENDS} = \{x \in \{a, b\}^* \mid |x| > 0 \wedge x[0] = x[-1]\}$, i.e. the language of non-empty strings where the first symbol matches the last symbol.

Let M be a DFSA such that $\mathcal{L}(M) = \text{BOOKENDS}$. Suppose there exists a state q such that $\delta^*(s, aa) = \delta^*(s, bb) = q$, where s is the start state of M . Show that this leads to a contradiction.

Solution If $\delta(q, a)$ is an accepting state, we accept $bb a$, which is not in BOOKENDS . If it is not accepting, then we reject aaa , which is in the language. In either case, this contradicts the assumption that M accepts BOOKENDS .