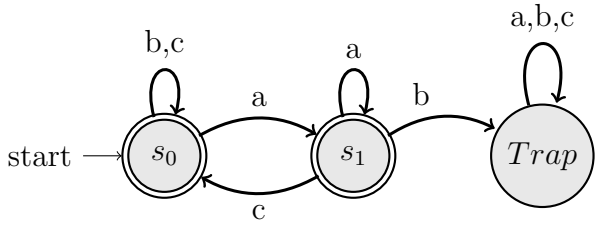
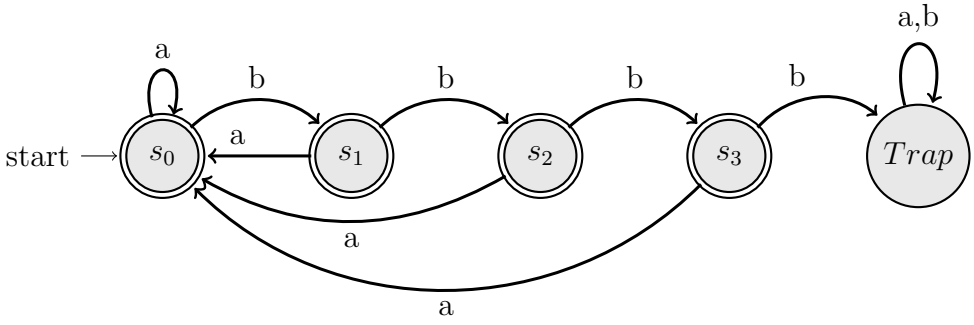
ComS 331 **Spring 2025** **Name: Mobina Amrollahi**

HW 2 Due: 07 Feb 2025

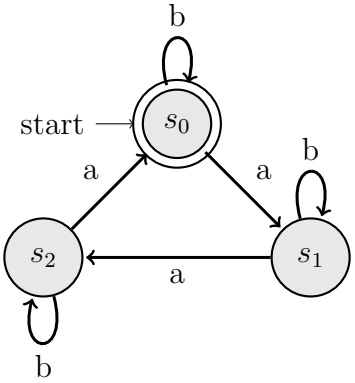
1. Draw a DFA, simplified to the best of your abilities (but including a trap state, if needed), that recognizes the language of all strings of a's, b's, and c's where a is never immediately followed by b.
Answer



2. Draw a DFA, simplified to the best of your abilities (but including a trap state, if needed), that recognizes the language $L = \{w \in \{a, b\}^* : w$ does not have a run of 4 or more b's$\}$.
Answer

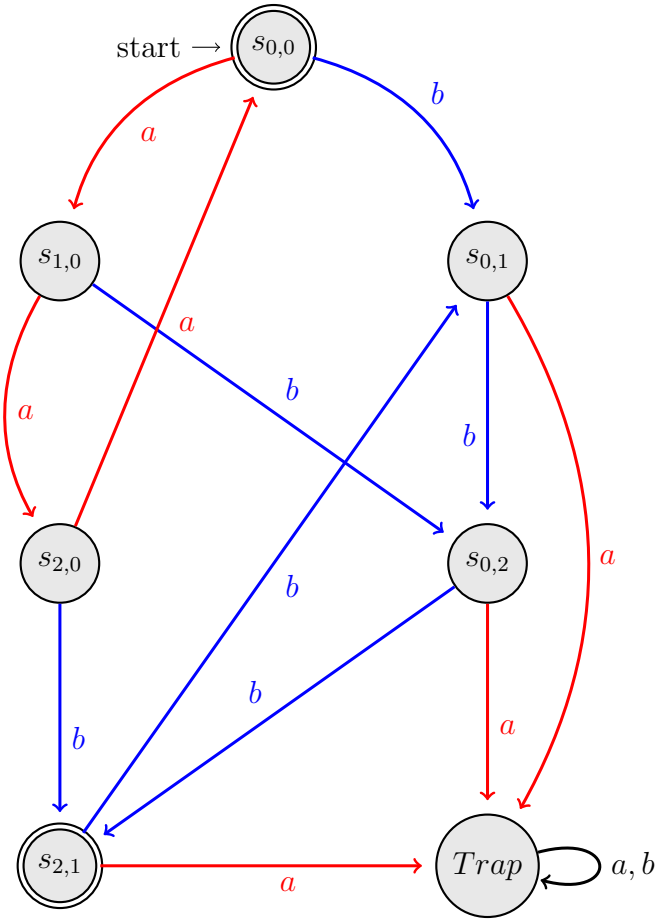


3. Draw a DFA, simplified to the best of your abilities (but including a trap state, if needed), that recognizes the language $L = \{w \in \{a, b\}^* : |w|_a \mod 3 = 0\}$.
Answer



4. Draw a DFA, simplified to the best of your abilities, that recognizes the language $L = \{a^i b^j : (i + j) \bmod 3 = 0\}$. Please explicitly draw the trap state, if needed, in your DFA.

Answer



5. Draw a DFA, simplified to the best of your abilities (but including a trap state, if needed), that accepts the language L of the natural numbers that are multiples of 5, written in base 10. For example, 0 and 435 belong to L, but 00, 0435, and 5328 do not.

Answer