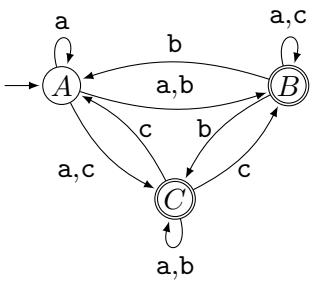
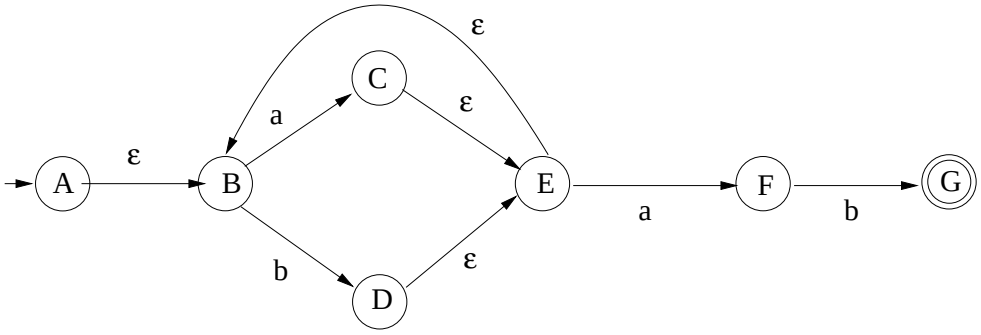
Nondeterministic finite automata

1. Create a deterministic finite automaton from this nondeterministic one by the method we used in class.



   What is the language this automaton accepts?

2. Create a deterministic finite automaton from this nondeterministic one by the method we used in class.



3. Give NFA (or DFA) recognizing the language

$$L = \{w \mid w \text{ contains two 1s such that the number of 0s between them is divisible by 4 }\}.$$

   (There may be some other 1s between the two 1s.)

4. The language $L_k \subseteq \Sigma = \{\texttt{a},\texttt{b}\}$ consists of those strings where the kth character from the end is `b`.
   (a) Give a NFA with $k+1$ states that accepts L_k.
   (b)* Show that any DFA for L_k has at least 2^k states.