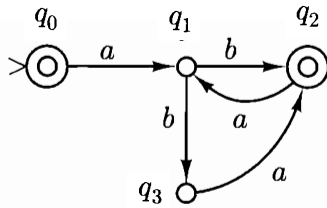


- (1) a) Apply (using pen and paper) the recognition algorithm on slide 17 to the nondeterministic automaton shown below and the input string "ababa". Assume that the transition  $(q_1, b, q_2)$  is processed before  $(q_1, b, q_3)$ .
- b) Bonus: There is a problem with this algorithm. Which one? How can the algorithm be improved?



- (2) Construct a deterministic automaton for the nondeterministic automaton from (1), using the subset construction algorithm on slide 25.
- (3) Implement the recognition algorithm for NFA on slide 17. Your submission should use the automaton from (1) and the following inputs as test case:
- $ab \in L(M)$
  - $aba \in L(M)$
  - $abaab \in L(M)$
  - $abba \notin L(M)$
  - $aabab \notin L(M)$
  - More test cases are welcome!
- (4) Implement the subset construction algorithm on slide 25. Your submission should use the automaton from (1) as a test case.