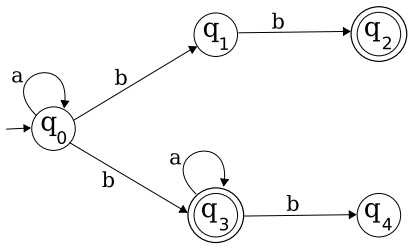
This homework covers the reading from Chapter 3, Sections 5 and 6. It is due by the end of Wednesday, March 31, and will be accepted late with a 10% penalty until noon on Monday, April 5.

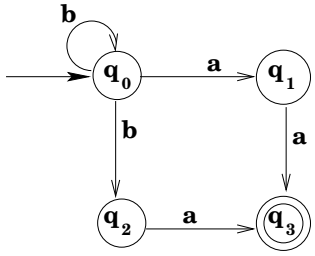
1. (*4 points)* Consider the NFA that is defined by the transition diagram shown at the right. Determine which of the following strings are accepted by this NFA. (Just list the accepted strings.) Then find a regular expression for the language that is accepted by the NFA. No explanation is necessary.



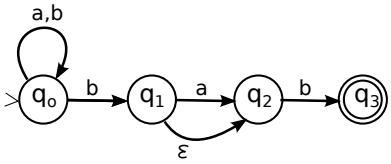
a) *aaab* **b)** *aabb* **c)** *bbbbb* **d)** *bb*
e) *bbb* **f)** *baaaa* **g)** *aaabab* **h)** *baaabab*

2. (*10 points)* For each of the following NFAs, use the NFA-to-DFA conversion algorithm to construct a DFA that accepts the same language as the NFA. (You must use the algorithm, and the states in the DFA should be sets of state from the NFA.)

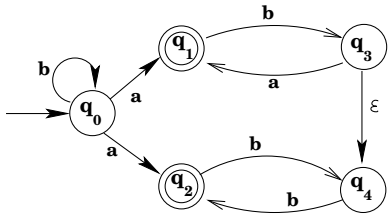
a)



b)



c)



3. (*6 points)* For each of the following regular expressions, use the regular-expression-to-NFA conversion algorithm to construct an NFA that accepts the language that is generated by the expression. Do not just give an NFA that accepts the same language; show the NFA that is constructed by following the algorithm exactly.

a) a^*ba^*

b) $(a|b)^*(aaa|bbb)$

c) $(ab|ba)c^*(a|b)$