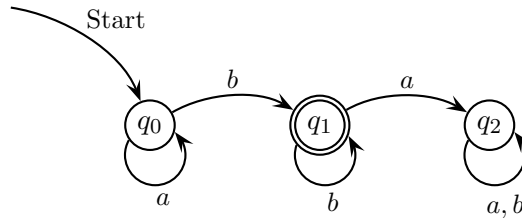


CS321
Theory of Computation
Quiz 1, Fall 2008

Name:

1. Consider the following DFA M ,



- (a) Circle the strings from the following list that are accepted by M .

λ , REJECT
 aa , REJECT
 bb , ACCEPT
 ab , ACCEPT
 $aabbb$, ACCEPT
 aba , REJECT

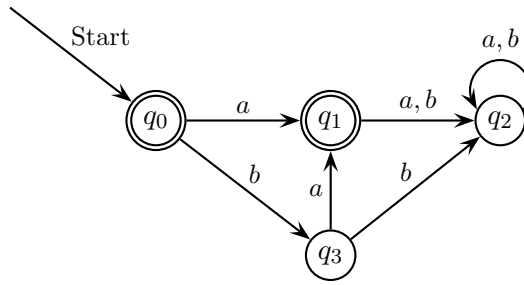
- (b) Let δ^* be the extended transition function for M . Indicate the value returned by δ^* for the following arguments:

$\delta^*(q_0, \lambda) = q_0$
 $\delta^*(q_0, aabb) = q_1$
 $\delta^*(q_0, bba) = q_2$
 $\delta^*(q_1, aabb) = q_2$
 $\delta^*(q_2, abaa) = q_2$

- (c) Describe $L(M)$ using set notation.

$$L(M) = \{a^n b^m : n \geq 0, m \geq 1\}$$

2. Draw a DFA M with alphabet $\Sigma = \{a, b\}$ such that $L(M) = \{\lambda, a, ba\}$.



3. Consider the following language over the alphabet $\Sigma = \{a, b\}$,

$$L = \{au : u \in b^n, n \text{ is even}\}$$

(note that zero is considered to be an even number)

(a) Circle the strings from the following list that are in L .

λ a *babb* abb *ab* abbbb *bba*

(b) Circle the strings from the following list that are in \overline{L} .

λ *a* *babb* *abb* *ab* *abbbb* *bba*

(c) Circle the strings from the following list that are in L^R .

λ a *babb* *abb* *ab* *abbbb* *bba*

(d) Draw a DFA M such that $L = L(M)$.

