

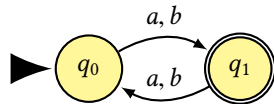
CSCI 340 — Homework 2

Professor Killian

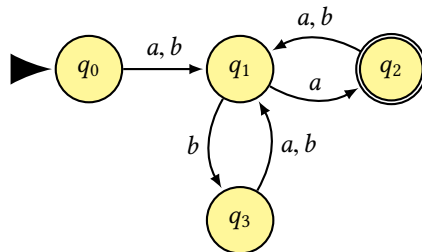
Due: February 3, 2019 @ 11:59PM

- For each of the problems below, give a regular expression which only accepts the following. Assume $\Sigma = \{a, b\}$
 - All strings that begin and end with the same letter
 - All strings in which the total number of a 's is divisible by 3
 - All strings that end in a double letter
- Show the following pairs of regular expressions define the same language
 - $(ab)^*a$ and $a(ba)^*$
 - $(a^*bbb)^*a^*$ and $a^*(bbba^*)^*$
- Describe (in English phrases) the languages associated with the following regular expressions
 - $(a + b)^*a(\lambda + bbbb)$
 - $(a(aa)^*b(bb)^*)^*$
 - $((a + b)a)^*$
- Build an FA that accepts only the language of all words with b as the second letter. Show both the picture and the transition table for this machine and find a regular expression for the language.
- Find two FA's that satisfy these conditions: Between them they accept all words in $(a + b)^*$, but there is no word accepted by both machines.
- Describe the languages accepted by the following FA's:

(a)



(b)



(c)

