

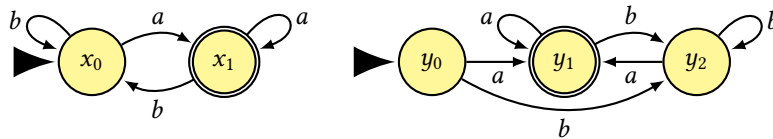
CSCI 340 — Homework 6

Professor Killian

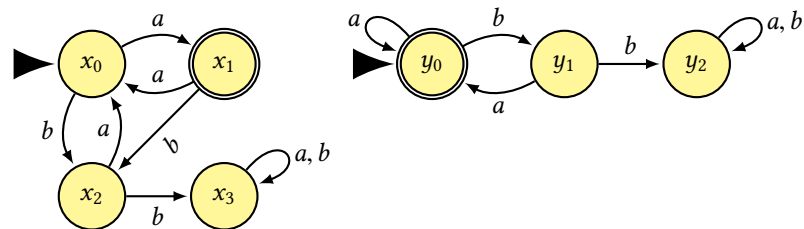
Due: March 10, 2019 @ 11:59PM

- For each of the following pairs, find a RE and FA that define $L_1 \cap L_2$
 - $(a + b)^*a$ $b(a + b)^*$
 - Even-length strings $(b + ab)^*(a + \lambda)$
 - Odd-length strings $a(a + b)^*$
 - Even-length strings Strings with an even number of a 's
- Use the pumping lemma, show each are non-regular
 - $a^n b^{n+1}$
 - $a^n b^n a^n$
- Using Myhill-Nerode theorem, show each are non-regular
 - EVEN-PALINDROME (all PALINDROMES with even length)
 - SQUARE ($a^{n^2} \mid n \geq 1$)
- Let us define PARENTHESES to be the set of all algebraic expressions where everything but parentheses have been deleted e.g. $\{\lambda () (()) () ((())) ()() ()() ()() ()() \dots\}$
 - Show its non-regular using Myhill-Nerode
 - Show the pumping lemma can't prove that it's non-regular
 - If we convert $($ to a and $)$ to b , show that PARENTHESES becomes a subset of EQUAL in which each word has the property that when read from left-to-right, there are never more b 's than a 's
- Show the following FAs are equivalent:

(i).

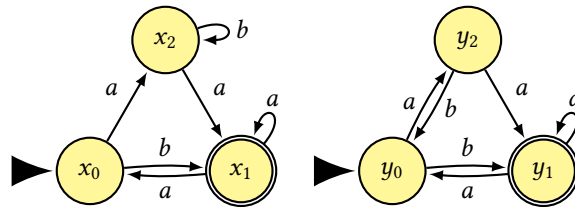


(ii).

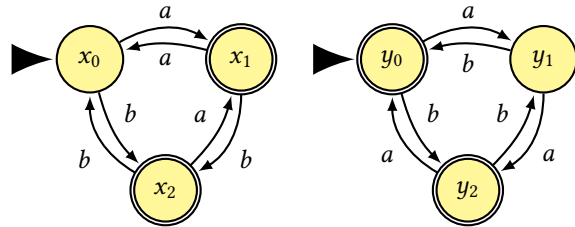


6. Using the method of intersecting each machine with the complement of each other, determine whether two machines accept the same language (or not)

(i).

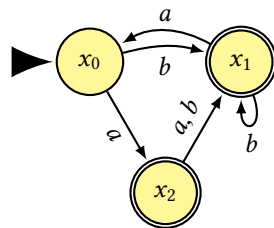


(ii).



7. Do the following FAs accept a finite or infinite language? Justify.

(i).



(ii).

