

CSC236 tutorial exercises, Week #12

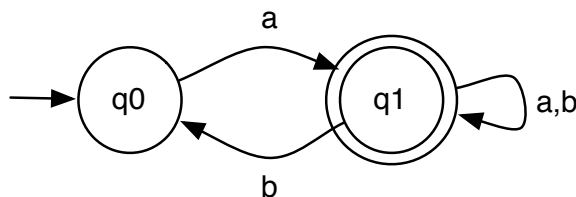
(best before Thursday afternoon)

Here are your tutorial sections:

Surname	Time	Room	TA
A-K	Friday 11	SS1088	Zhaowei
L-Tg	Friday 11	SS2105	Hamed
Th-Z	Friday 11	BA2175	Gal
A-L	Friday noon	AB114	Wen
M-Z	Friday noon	BF323	Lauren
A-K	Friday 1	BA1170	Ammar
L-Tg	Friday 1	AB107	Alex
Th-Z	Friday 1	AB114	Shems
A-K	Thursday 8	BA2139	Zach
L-Tg	Thursday 8	BA2185	Ekansh
Th-Z	Thursday 8	BA2195	Danniel

Let the alphabet be $\Sigma = \{a, b\}$

1. Are regular expressions $(a + b)^*$ and $a^* + b^*$ equivalent? Explain.
2. Draw a DFSA corresponding to the regular expression $(a + b)(a + b)^*(a^* + b^*)$. Write down the corresponding state invariant that you could use to prove the equality of your DFSA to the regular language represented by the provided regexp. You don't need to provide the proof.
3. Consider an FSA M_1 :



- (a) Is this a DFSA or an NFSA? Why?
- (b) Write down the language \mathcal{L} that it represents (a sentence describing all strings included in the language \mathcal{L})

- (c) Write down the complement $\overline{\mathcal{L}}$ of \mathcal{L} , i.e. $\overline{\mathcal{L}} = \Sigma^* - \mathcal{L}$ in one sentence
 - (d) Draw an FSA for $\overline{\mathcal{L}}$
4. Consider a regexp $R_1: a(ba^*)(a^* + b^*)$
- (a) Draw an NFSA M_2 corresponding to the R_1 above
 - (b) Write down the language \mathcal{L} that it represents (a sentence describing all strings)
 - (c) Draw a corresponding DFSA