

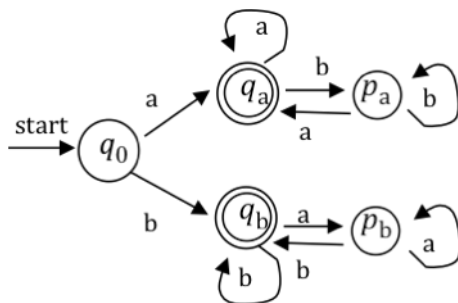
Exercises for FLL, Fall 2018, sheet 2 – Solutions

Return Thursday Sep 20, in class

Note: you may work in teams of 2 if you wish. If you do, hand in a single solution sheet for both of you.

Exercise 1. Design a DFA which accepts the language $L = \{ w \in \{a, b\}^* \mid |w| > 0, \text{ and the last symbol in } w \text{ is equal to the first} \}$. Describe your DFA both by a complete transition table and through a graphical transition diagram.

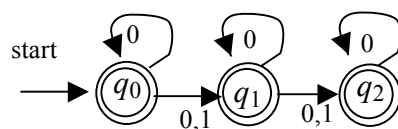
Solution. The simplest DFA which does this has 5 states:



Transition table:

	a	b
q_0	q_a	q_b
q_a^*	q_a	p_a
q_b^*	p_b	q_b
p_a	q_a	p_b
p_b	p_b	q_b

Exercise 2. Describe the language accepted by the NFA shown below in plain English.



Solution. This NFA accepts all words over the binary alphabet which contain at most two 1's.

Exercise 3. Construct a DFA equivalent to the NFA depicted above, using the subset construction. Present your DFA by a transition diagram.

Solution.

