THEORY OF COMPUTATION - HOMEWORK 1

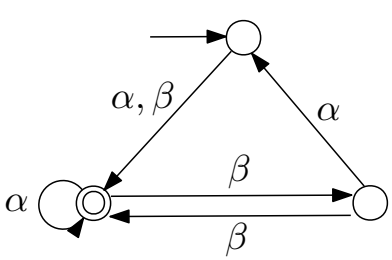
Assigned 2019.10.08. Submission deadline 2019.10.29 (for only those who want their homework to be marked).

Problems

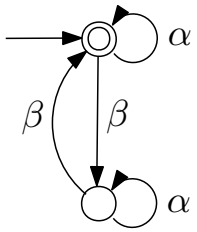
1. Provide a real-life example of a finite automaton. Describe the states and state transitions. Write down the automaton model $\mathbf{G} = (Q, \Sigma, \delta, q_0, Q_a)$.

2. Let the alphabet be $\Sigma = \{\alpha, \beta\}$, and consider a language $L = \{\beta(\alpha\beta)^n\alpha \mid n = 0, 1, 2, ...\}$. Design a finite automaton $\mathbf{G}$ to accept L, i.e. $L(\mathbf{G}) = L$.

3. Consider the two finite automata $\mathbf{G}_1, \mathbf{G}_2$ displayed in the figure below. Derive a finite automaton $\mathbf{G}$ that accepts $L(\mathbf{G}_1) \cup L(\mathbf{G}_2)$.



$\mathbf{G}_1$



$\mathbf{G}_2$
