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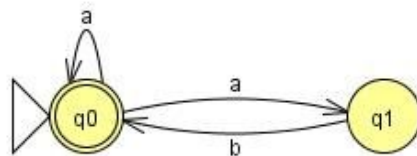
HW 3

0) I collaborated with Carlo Bilbao on this homework assignment. We talked about the questions together, clarified what each one is asking for, and discussed our approach for how to solve them.

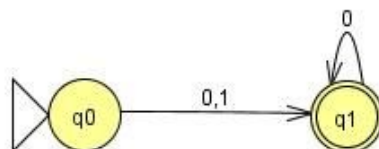
- 1) a) There are 8 states in Q' , representing the subsets of Q
b) The start state is $\{q_1, q_2\}$
c) 2 states: $\{q_2\}$ and $\{q_1, q_2, q_3\}$
d) $\{q_2\}$

2) $(1^*) \circ ((0^*) \circ 1)^*$

3)



4)



5) For proof by contradiction, suppose that a L is a regular language with a pumping length p . Consider $s = 1^p\#$. Next, consider any $s = xyz$ such that $|y| > 0$ and $|xy| \leq p$. This means that $y = 1^k$ for some $k > 0$. Then, if we consider $i = 2$, then $xy^iz = xyyz = 1^{p+k}\#$, which is not an element of A because the $\#$ -separated list would no longer contain all distinct unary values. Thus, L cannot be regular.