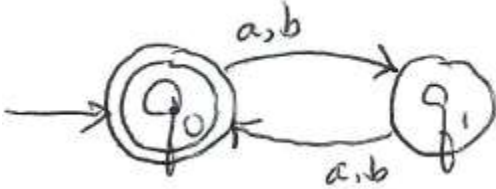


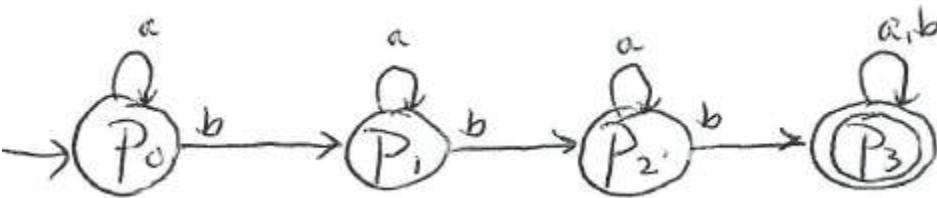
**Theory of Computation, CSCI 438 spring 2022**  
**Quiz 2, Jan. 26**

1. Following are two DFAs defined over the alphabet  $\Sigma = \{a, b\}$ .

DFA that recognizes the language  $\{w \mid w \text{ has an even length}\}$ :



DFA that recognizes the language  $\{w \mid w \text{ contains at least three b's}\}$



Use the method described in the text and in class to create a DFA for language  
 $\{w \mid w \text{ has an even length and an odd number of a's}\}$  (10 pts.)  
 $\{w \mid w \text{ has an even length and contains at least three b's}\}$

2. Prove that regular languages are closed under intersection. That is, show that if the languages  $A$  and  $B$  are regular, then the language  $A \cap B$  is regular. (Note, this is proving that the construction which you used in the previous question, works.)  
(10 pts.)