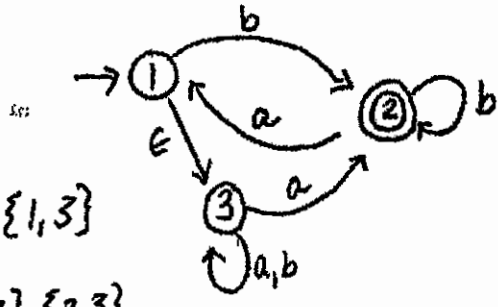1. Construct DFAs for each of the languages below and provide complete state diagrams that illustrate their operation. Assume the alphabet $\Sigma = \{0,1\}$.

    a. $\{w \mid w$ begins with a 1 and ends with a 0$\}$
    b. $\{w \mid w$ contains at least two 1s$\}$
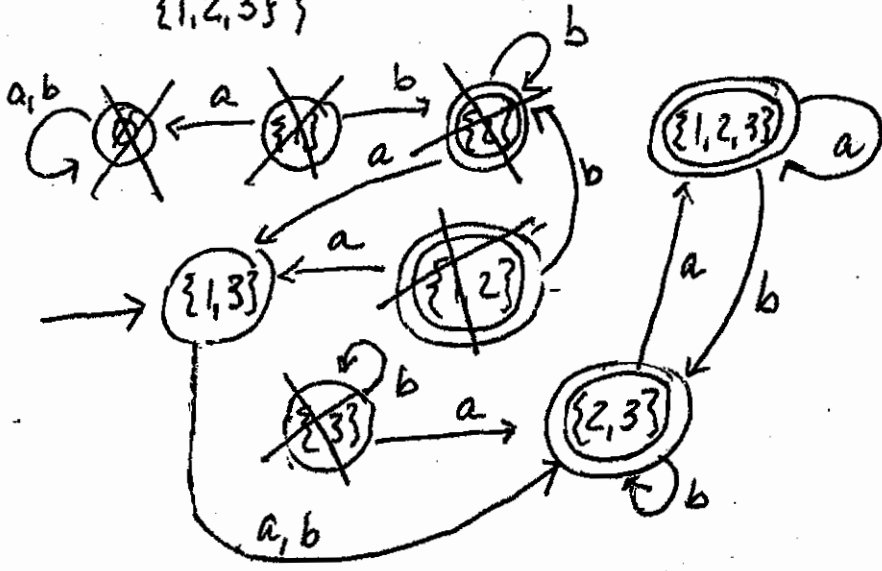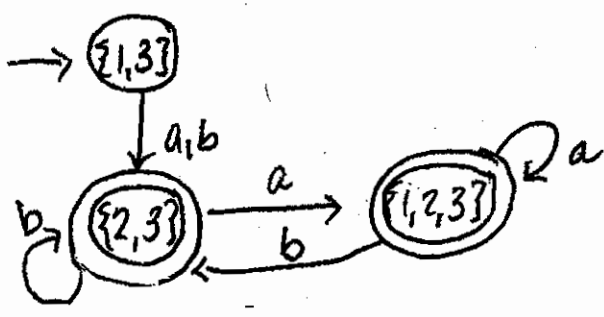   c. $\{w \mid w$ contains the substring 1011$\}$
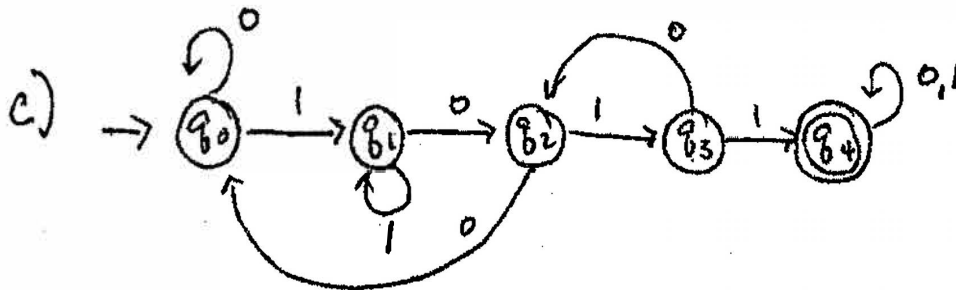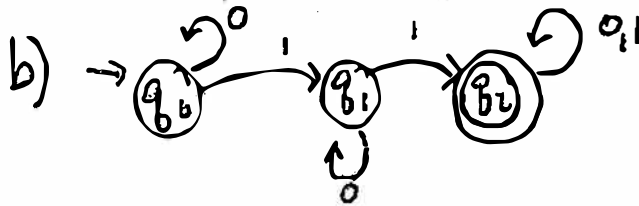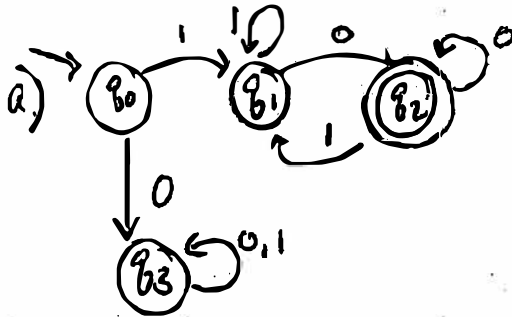
2. Provide the state diagram of a DFA that is equivalent to the NFA below:

DFA

$q_0' = E(\{1\}) = \{1,3\}$

$F' = \{ \{2\}, \{1,2\}, \{2,3\}, \{1,2,3\} \}$

Reduced DFA (3 states):

It is possible to further reduce the {2,3} and {1,2,3} states into a single state; no points deducted for a 3-state DFA.