CS 360: Assignment 2

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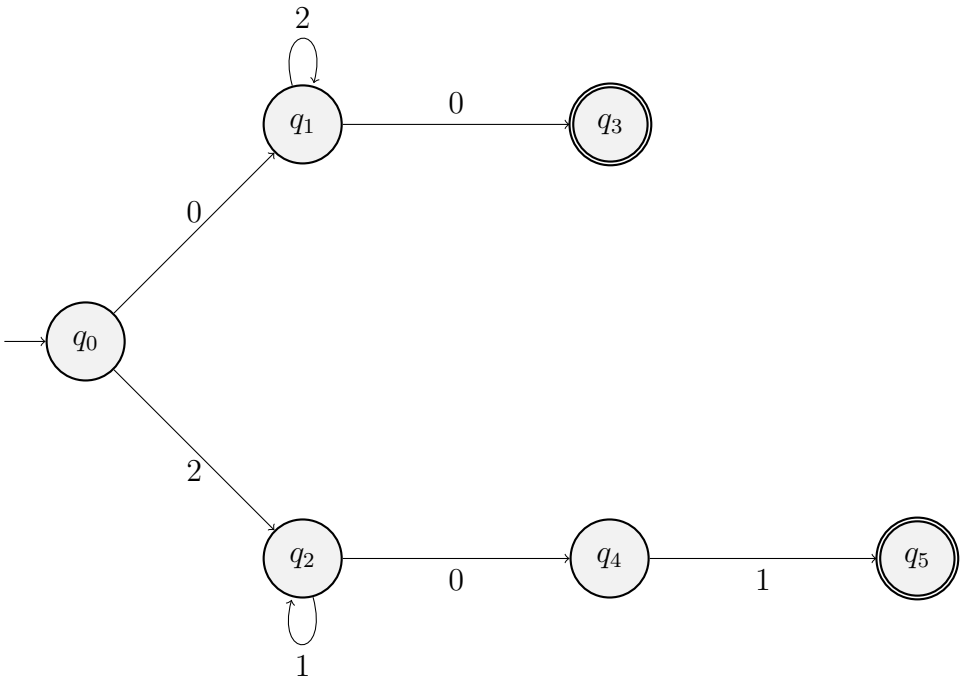
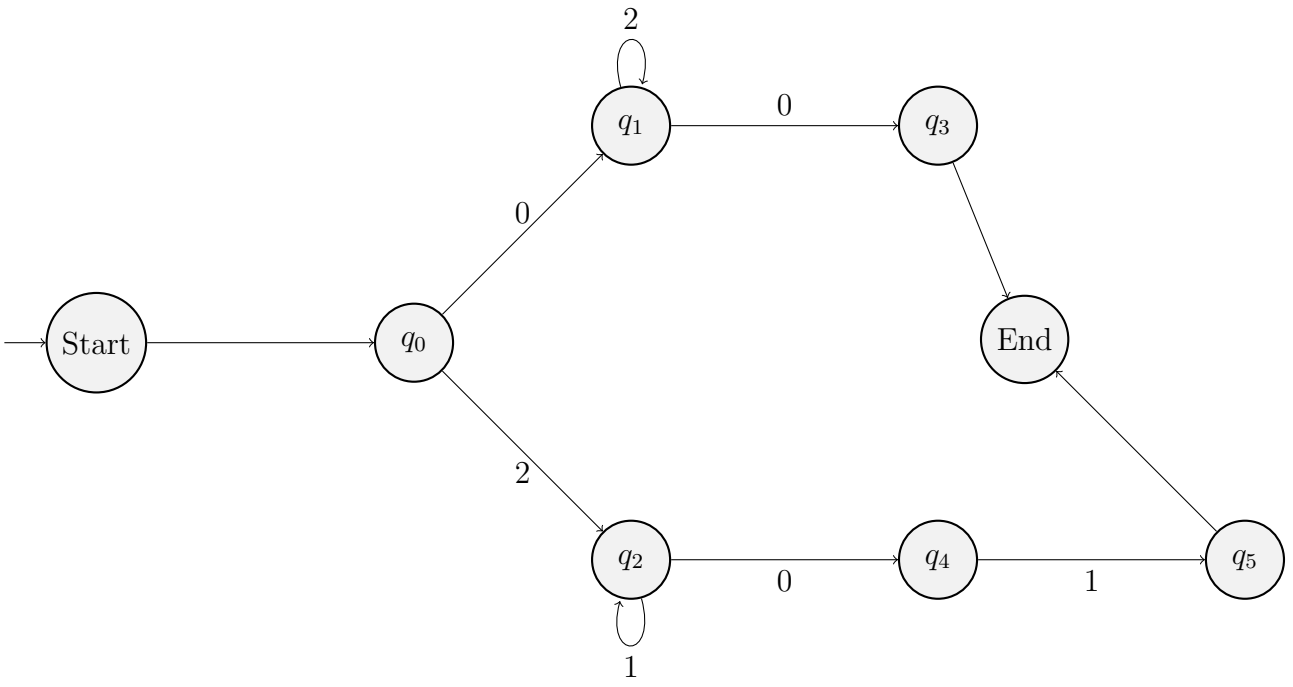
September 29, 2024

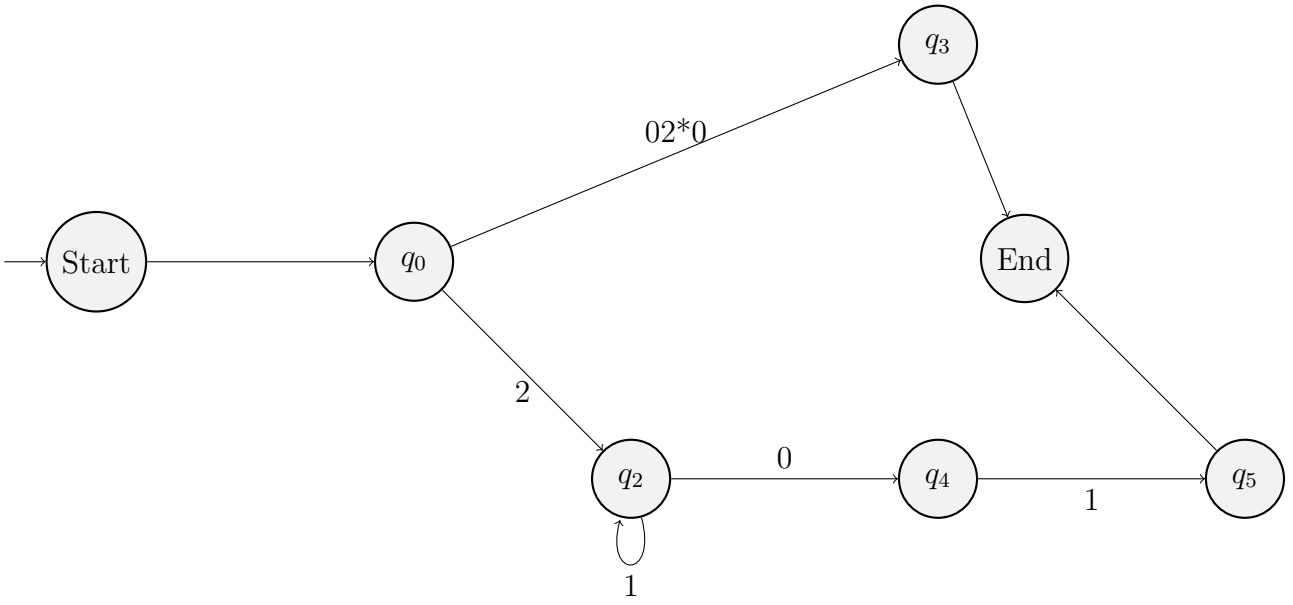
1. (10 points) Use the method of eliminating states to find a regular expression for the following NFA. The alphabet of the machine is $\sum = 0, 1, 2$. Draw the initialization step and then draw the machine at each step of the process. Eliminate the states in this order: $q1$, $q2$, $q3$, $q4$, $q5$, $q0$.



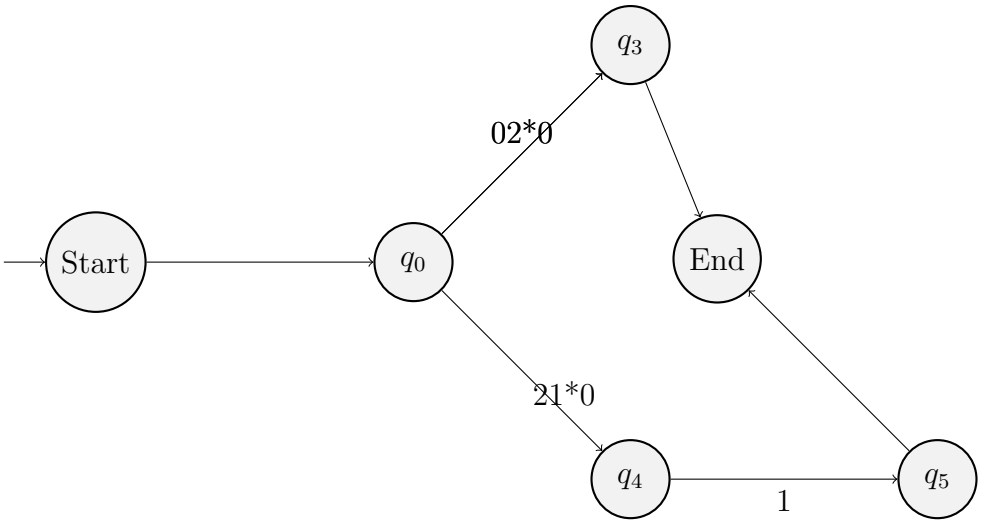
Initializing:



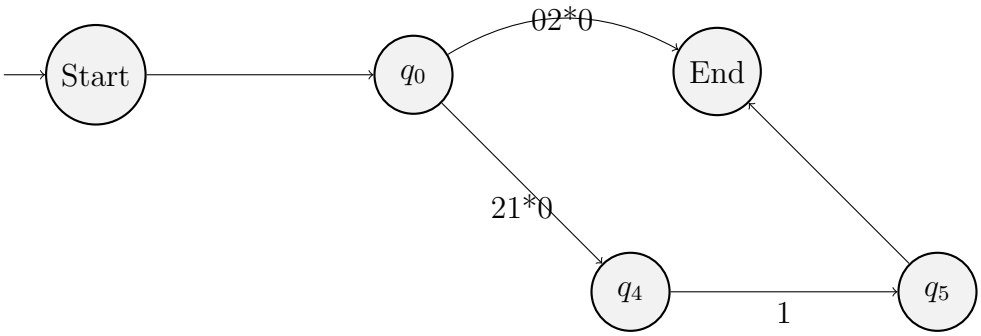
Removing q_1:



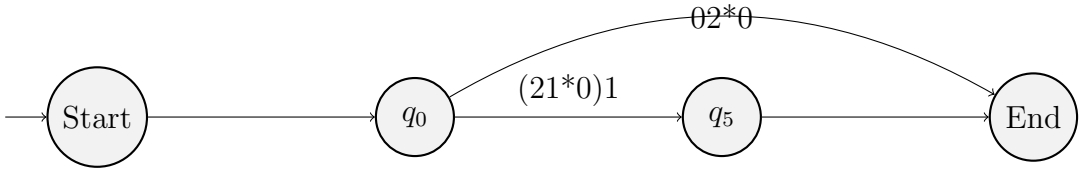
Removing q_2:



Removing q_3:

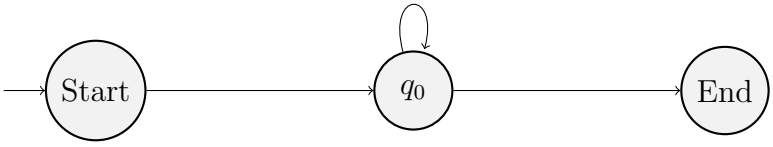


Removing q_4:

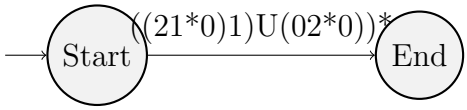


Removing q_5:

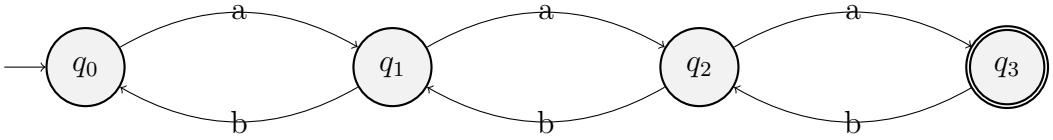
((21*0)1)U(02*0))



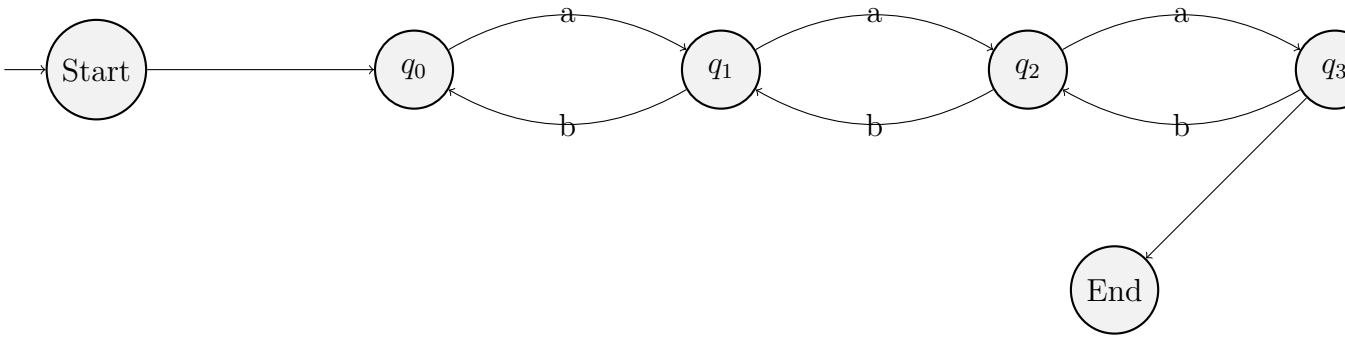
Final regular expression:



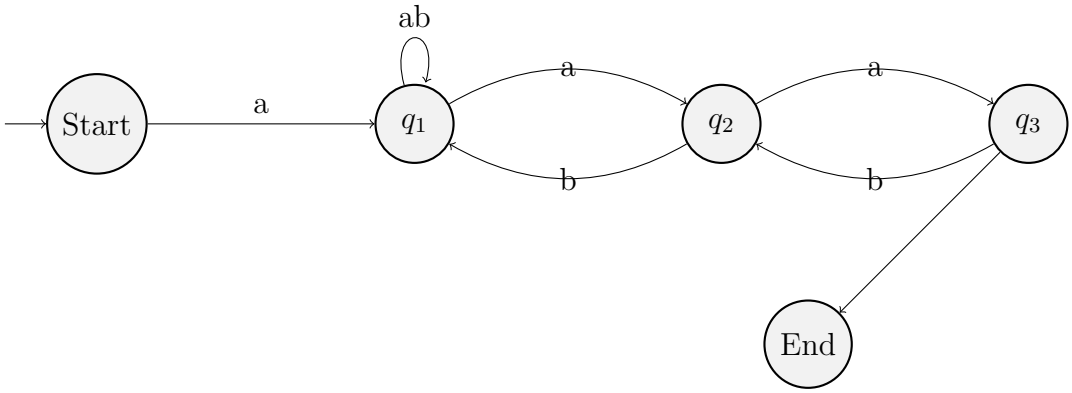
2. (10 points) Use the method of eliminating states to find a regular expression for the following NFA. The alphabet of the machine is $\sum = a, b$. Draw the initialization step and then draw the machine at each step of the process. Eliminate the states in this order: q_0, $q1$, $q2$, $q3$.



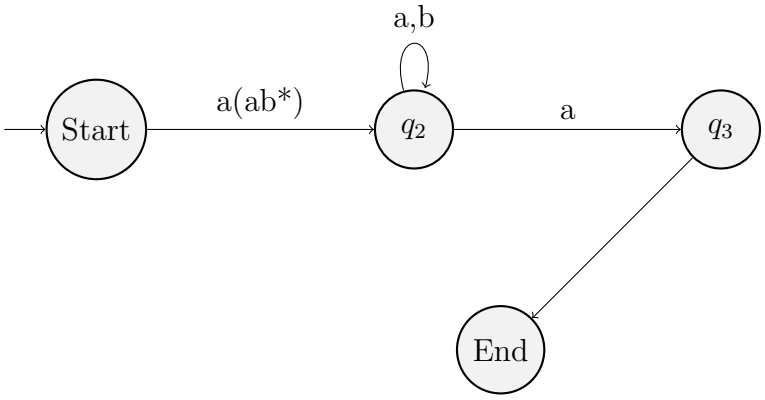
Initializing:



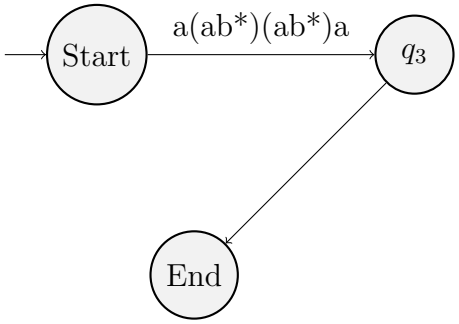
Removing q_0:



Removing q_1:



Removing q_2:



Removing q_3: