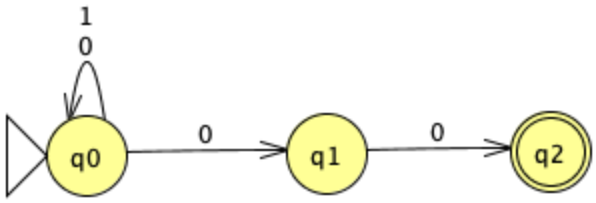
CSE 355: Intro to Theoretical Computer Science
Recitation #3 (20 pts)

- **Due: Tuesday, Feb. 2, 2021 at 11:59pm** Arizona time on Canvas.

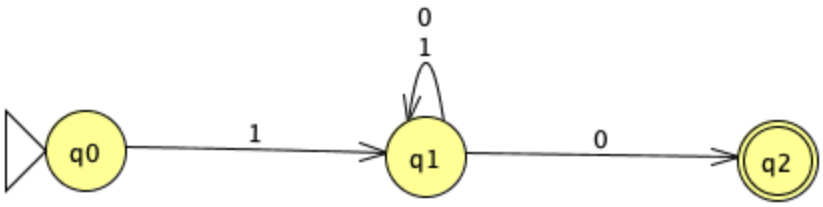
1. [5 pts] Use JFLAP (http://www.jflap.org) to draw the state diagram of NFA with **three** states that recognize the following language, assume alphabet $\Sigma = \{0, 1\}$. (Save the diagram as .jpg file and paste it here)

$$L = \{\omega | \ \omega \text{ ends in } 00\}$$

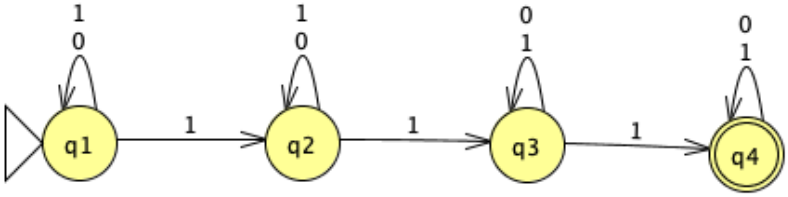


2. [5 pts] Use the construction in the proof of Theorem 1.45 (textbook pp.80) to give the state diagram of NFA that recognize the ***union*** of the following two languages ($L_1 \cup L_2$). First construct NFAs state diagram using JFLAP (http://www.jflap.org) for each individual language, then combine them. Assume alphabet $\Sigma = \{0, 1\}$.

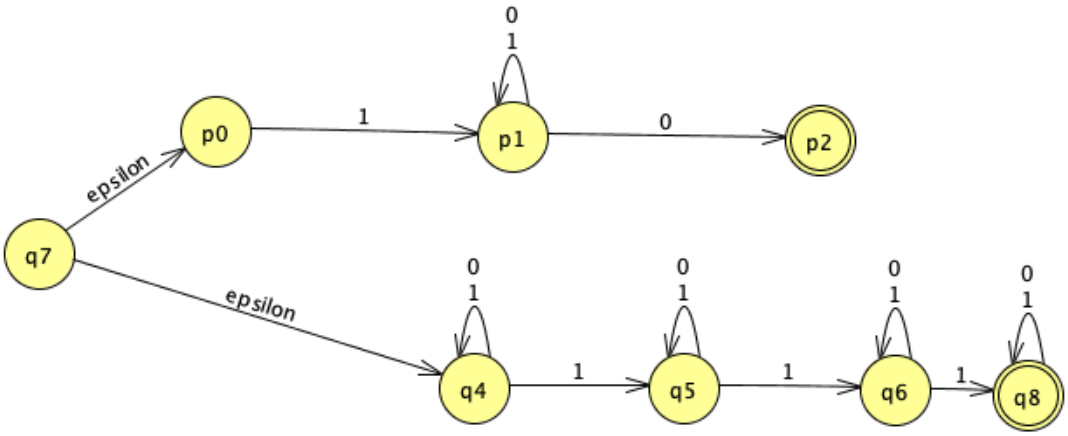
$L_1 = \{\omega | \ \omega \text{ begins with a 1 and ends with a 0}\}$



L_2 = {ω| ω contains at least three 1s}

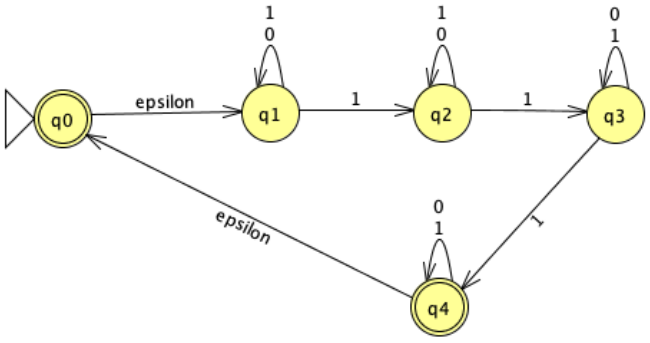


Combine:

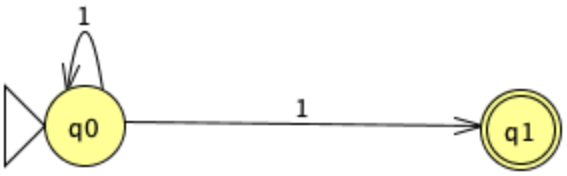


3. [5 pts] Use the construction in the proof of Theorem 1.49 (textbook pp.83) to give the state diagram of NFA that recognize the ***star*** of the following language (L_1^*). Assume alphabet $\Sigma = \{0, 1\}$.

L_1 = {ω| ω contains at least three 1s}



4. [5 pts] Let alphabet $\Sigma = \{0, 1\}$ and $L = \{\omega | \omega = 1^m 0^n \text{ such that } m \geq 0, n \geq 1\}$ A)
[2pts] Draw the state diagram of an NFA with no more than two states that recognize L



B) [3 pts] Use the powerset construction method discussed in class to convert above NFA into a DFA (no need to simplify your DFA), draw its state diagram.