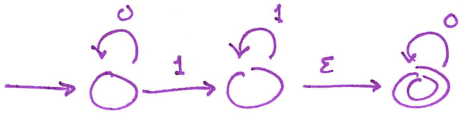
Name: Key **CS301 F3**

1. **(__ /2 pt)** Create a NFA recognizing the language described by $0^*1^+0^*$.

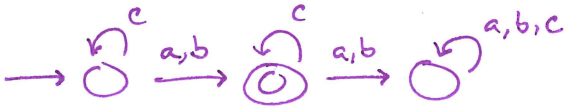


2. **(__ /2 pt)** Consider the alphabet $\Gamma = \{\mathtt{a}, \mathtt{b}, \#\}$. Let A be the language of all strings that begin and end with disjoint ## and have no intervening ab. Give a regular expression that describes A.

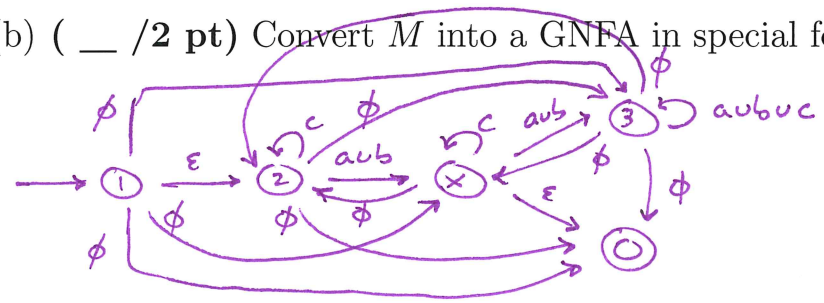
$\#\#(\mathtt{b} \cup \mathtt{a}^*\#)^*(\mathtt{a}^* \quad)\#\#$

3. Let B be the language described by $\mathtt{c}^*(\mathtt{a} \cup \mathtt{b})\mathtt{c}^*$.

   (a) **(__ /2 pt)** Create a ~~two~~ three-state DFA, M, which recognizes B.



   (b) **(__ /2 pt)** Convert M into a GNFA in special form.



   (c) **(__ /2 pt)** Choose any non-start and non-accept state in your diagram without a $\varnothing$-transition to the accept state. Rip that state from the machine and provide the resulting diagram.