1. Draw a transition diagram for a FSM with alphabet {*a*,*b,c*} that decides the set of all strings that contain *cacab* as a contiguous substring. Check your FSM.
2. Let $L\_{1}=\left\{x \right|x \in \{a,b\}^{\*}$ and $x$ has the same number of $a$’s as $b$’s}. Prove that $L\_{1}$ is not regular.