1. For a language $M$, define $M_{2022}$ as the set of all strings in $M$ of length exactly 2022. State whether the following are true or false: (No justification required.)

   (a) If $M$ is regular, then so is $M_{2022}$.

   (b) If $M_{2022}$ is regular, then so is $M$.

2. Given a string, the **slurp** of the string is obtained by duplicating every letter. For example, the slurp of TIGER is TTIIGGEERR. The slurp of a language is the slurps of all its strings.

   (a) Show that the regular languages are closed under slurp'ing, by providing a general algorithm to convert an FA for a language $L$ to an FA for the slurp of $L$.

   (b) Illustrate your algorithm on the following FA.