1. Construct an NFA that accepts all binary strings that have a 1 as the third-last character; i.e., $x\mathbf{1}ab$ for $a, b \in \{0, 1\}, x \in \{0, 1\}^*$

   For the next problems, write out a formal definition of the new NFA N'.

2. Given an NFA $N = (\Sigma, Q, \delta, s, A)$, construct an NFA N' that accepts all *prefixes* of $L(N)$, i.e., $w \in L(N') \Leftrightarrow wx \in L(N)$ for some $x \in \Sigma^*$.

3. Given an NFA $N = (\Sigma, Q, \delta, s, A)$, construct an NFA N' that accepts all *suffixes* of $L(N)$, i.e., $w \in L(N') \Leftrightarrow xw \in L(N)$ for some $x \in \Sigma^*$.

4. Given an NFA $N = (\Sigma, Q, \delta, s, A)$, construct an NFA N' that accepts $\texttt{insert1}(L(N))$, i.e., strings from $L(N)$ with a 1 inserted somewhere. In other words $x \in L(N')$ if $x = y\mathbf{1}z$ for some $y, z \in \Sigma^*$ and $yz \in L(N)$.

5. Given an NFA $N = (\Sigma, Q, \delta, s, A)$, construct an NFA N' that accepts the reverse of $L(N)$, i.e., $w \in L(N') \Leftrightarrow w^R \in L(N)$.