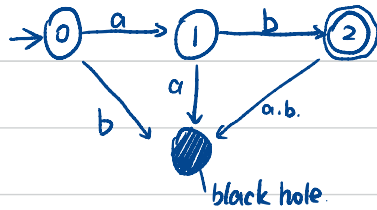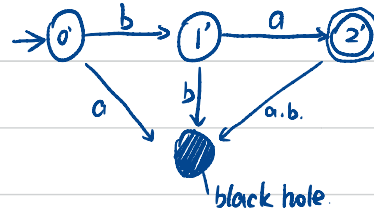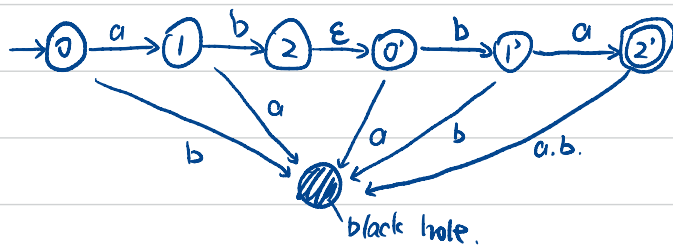Exercise 2:

1. M_1

M_2

2. $M_1 \circ M_2$

$L_1 L_2 = \{abba\}$.

"$abba$" $\rightarrow M_1 \circ M_2 \Rightarrow 0 \rightarrow 1 \rightarrow 2 \rightarrow 0' \rightarrow 1' \rightarrow 2'$, so $abba$ is accepted.

3.

necessary condition = M' should be DFA.

sufficient condition = M is DFA.

if $M \circ M'$ is deterministic:

$L(M) L(M')$ is accepted
     by $M \circ M'$.