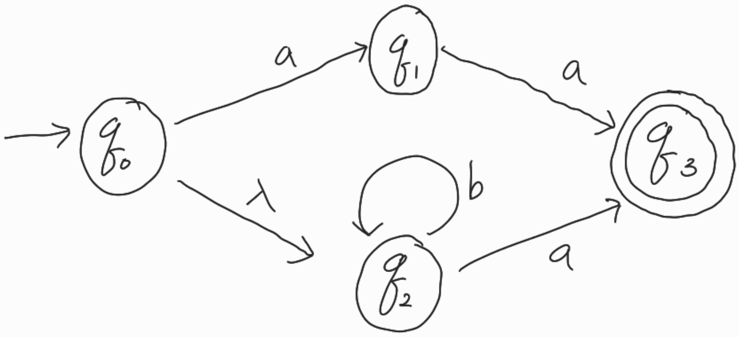
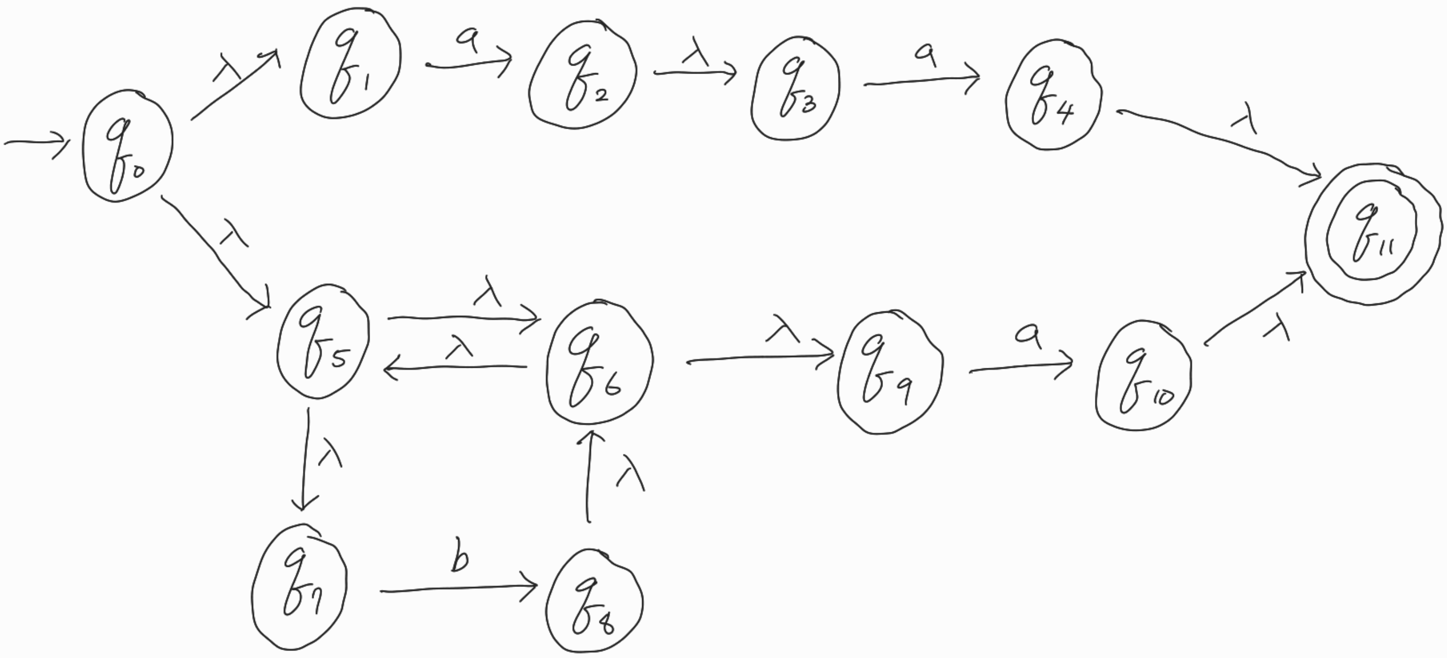
1. NFA for $\Sigma = \{a, b\}$ accepts $L(aa + b^*a)$



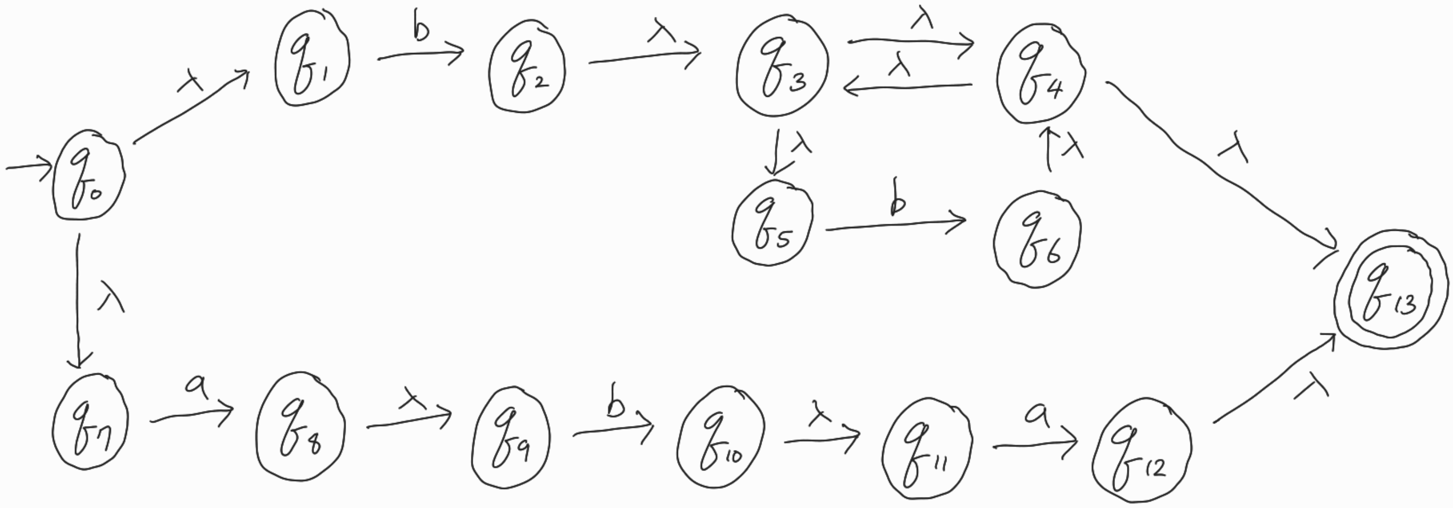
OR...



2. Regular expression for odd numbers of 'a' followed by 'bb'.

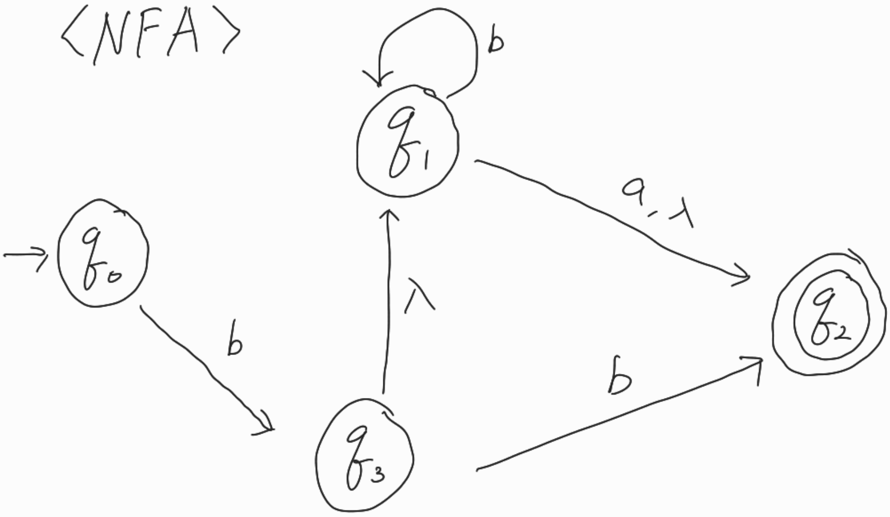
$\boxed{\therefore\ (aa)^*abb}$

3. NFA for $L(bb^* + aba)$



4.

<NFA>



In the path of $q_0 - q_3 - q_1 - q_2$, bb^*a or bb^* are accepted.

In the path of $q_0 - q_3 - q_2$, bb is accepted.

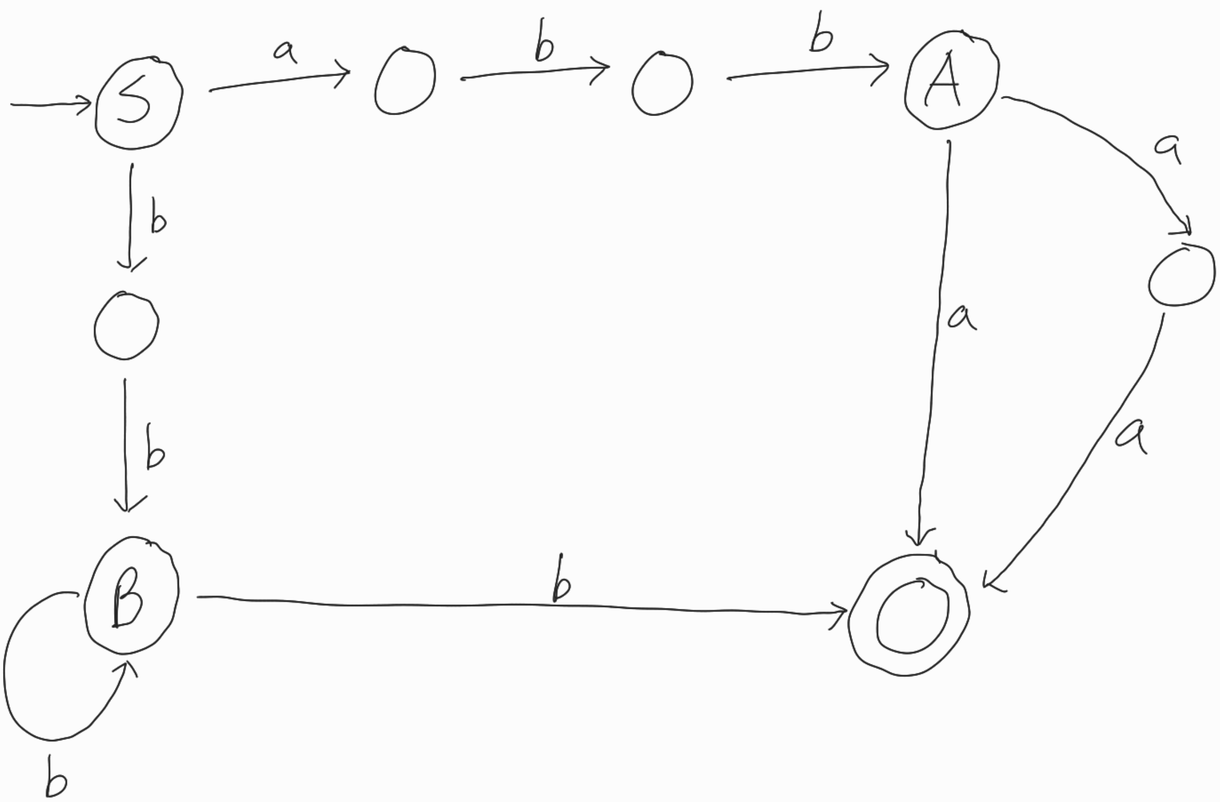
Regular expression of the language is $bb^*a + bb^* + bb$.

$$bb^*a + bb^* = bb^*(a+\lambda)$$

$$\boxed{\therefore\ bb^*(a+\lambda) + bb}$$

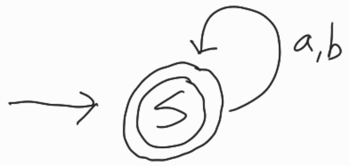
5.

$$\left.\begin{aligned} S &\to abbA \mid bbB \\ A &\to aa \mid a \\ B &\to bB \mid b \end{aligned}\right\} \Rightarrow \begin{aligned} &S \to abbA \text{ or } S \to bbB \\ &A \to aa \text{ or } A \to a \\ &B \to bB \text{ or } B \to b \end{aligned}$$



6. A right-linear grammar for $L((a+b)^*)$

We can construct a DFA for $\Sigma = \{a, b\}$ which accepts $L((a+b)^*)$.



$S \to \lambda$ or $S \to aS$ or $S \to bS$

$\Rightarrow S \to aS \mid bS \mid \lambda$

$$\boxed{\therefore\ S \to aS \mid bS \mid \lambda}$$