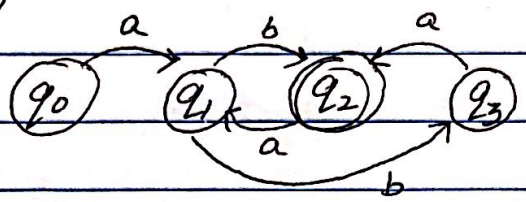
Q1 NFSA → Reg Gp



$q_0 \rightarrow \epsilon$

$q_1 \rightarrow q_0 a + q_2 a$

$q_3 \rightarrow q_1 b$

$$q_2 = q_1 b + q_3 a$$
$$= q_1 b + (q_1 b) a$$
$$= (q_0 a + q_2 a) b + (q_0 a + q_2 a) ba$$
$$= (a + q_2 a) b + (a + q_2 a) ba$$
$$= ab + q_2 ab + aba + q_2 aba$$
$$q_2 = q_2 (ab + aba) + (ab + aba)$$

using Arden's theorem { if $R = Q + RP$, $\Rightarrow R = QP^*$ }

+ : Denotes union

$$q_2 = (ab + aba)(ab + aba)^*$$

$\Rightarrow$ $(aba?)^+$ ($()^+$: Denotes 1 or more)

Regular Expression for given NFSA : $(ab + aba)(ab + aba)^*$

↳ which is equivalent to $(aba?)^+$

Q2.

1. I/PRP need/VBP a/DT flight/NN from/IN Atlanta/NN

Incorrect tag

Correct tag : Atlanta/NNP

2. Does/VBZ this/DT flight/NN serve/VB dinner/NNS

Incorrect tag

Correct tag : dinner/NN

3. I/PRP have/VB a/DT friend/NN living/VBG in/IN Denever/NNP

Incorrect tag

Correct tag : VBP

4. Can/VBP you/PRP list/VB the/DT nonstop/JJ afternoon/NN flights/NNS

Incorrect tag

Correct tag : MD