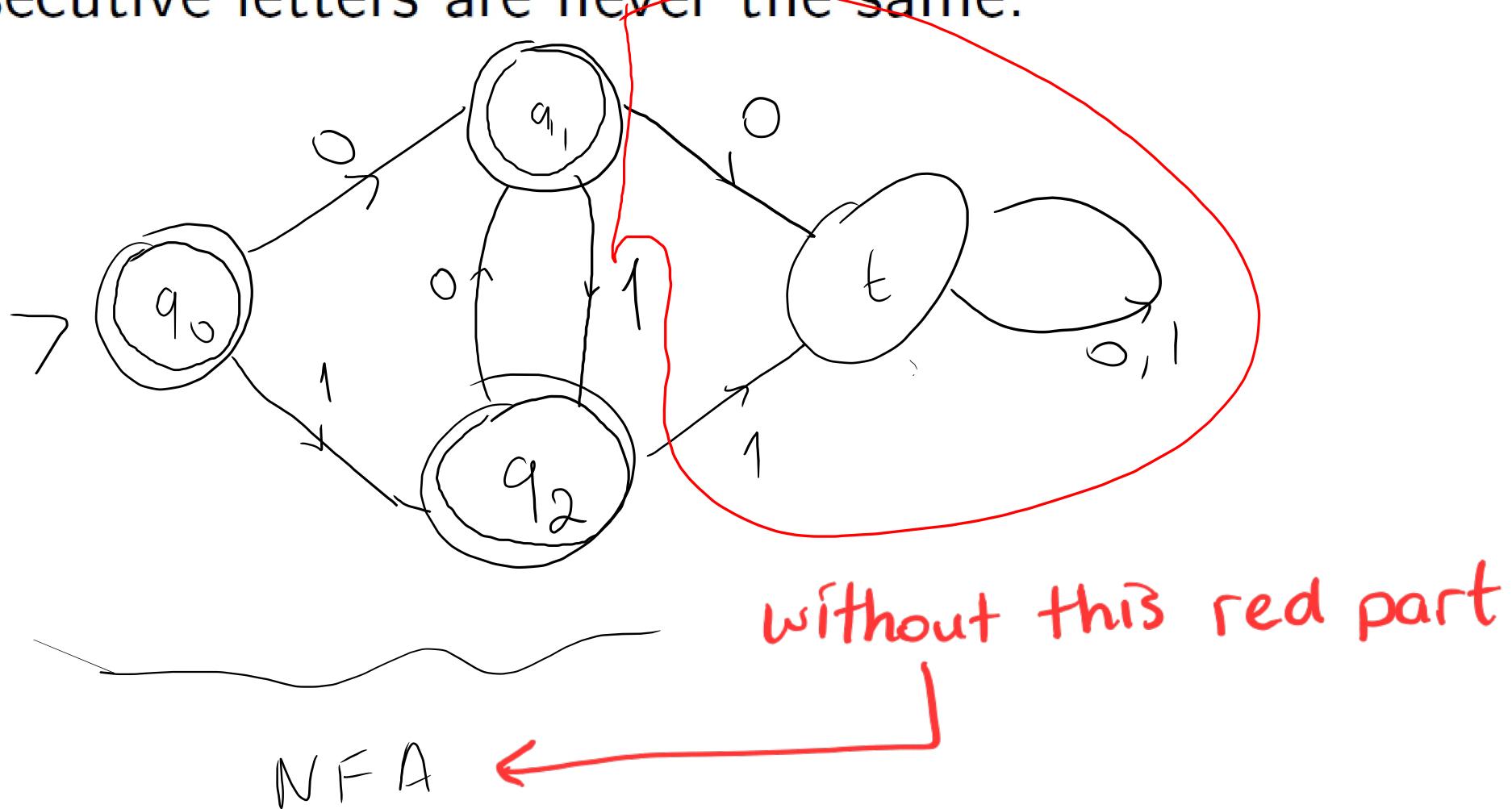
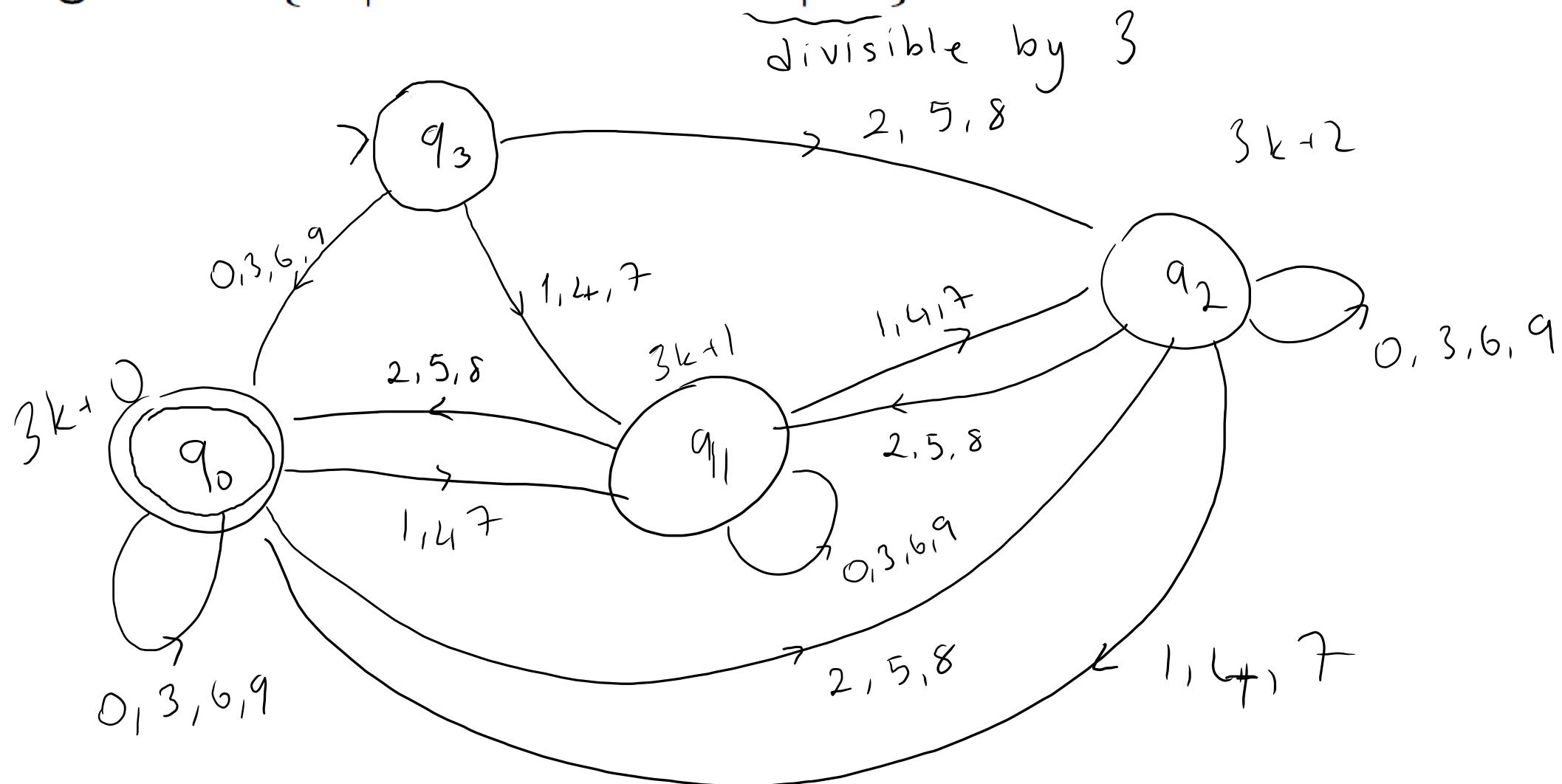


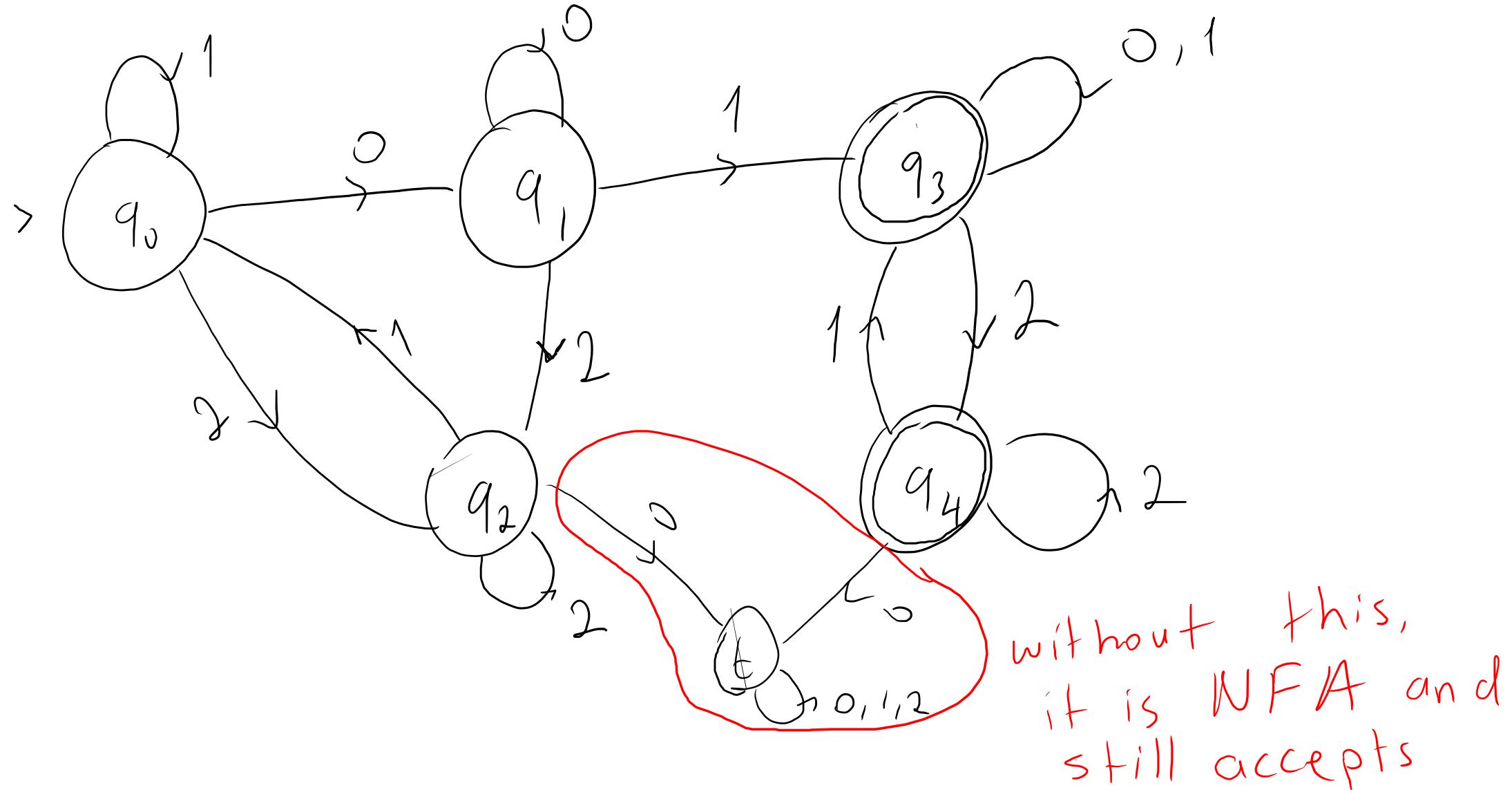
For alphabet $\Sigma = \{0, 1\}$, design a DFA/NFA accepts all strings that consecutive letters are never the same.



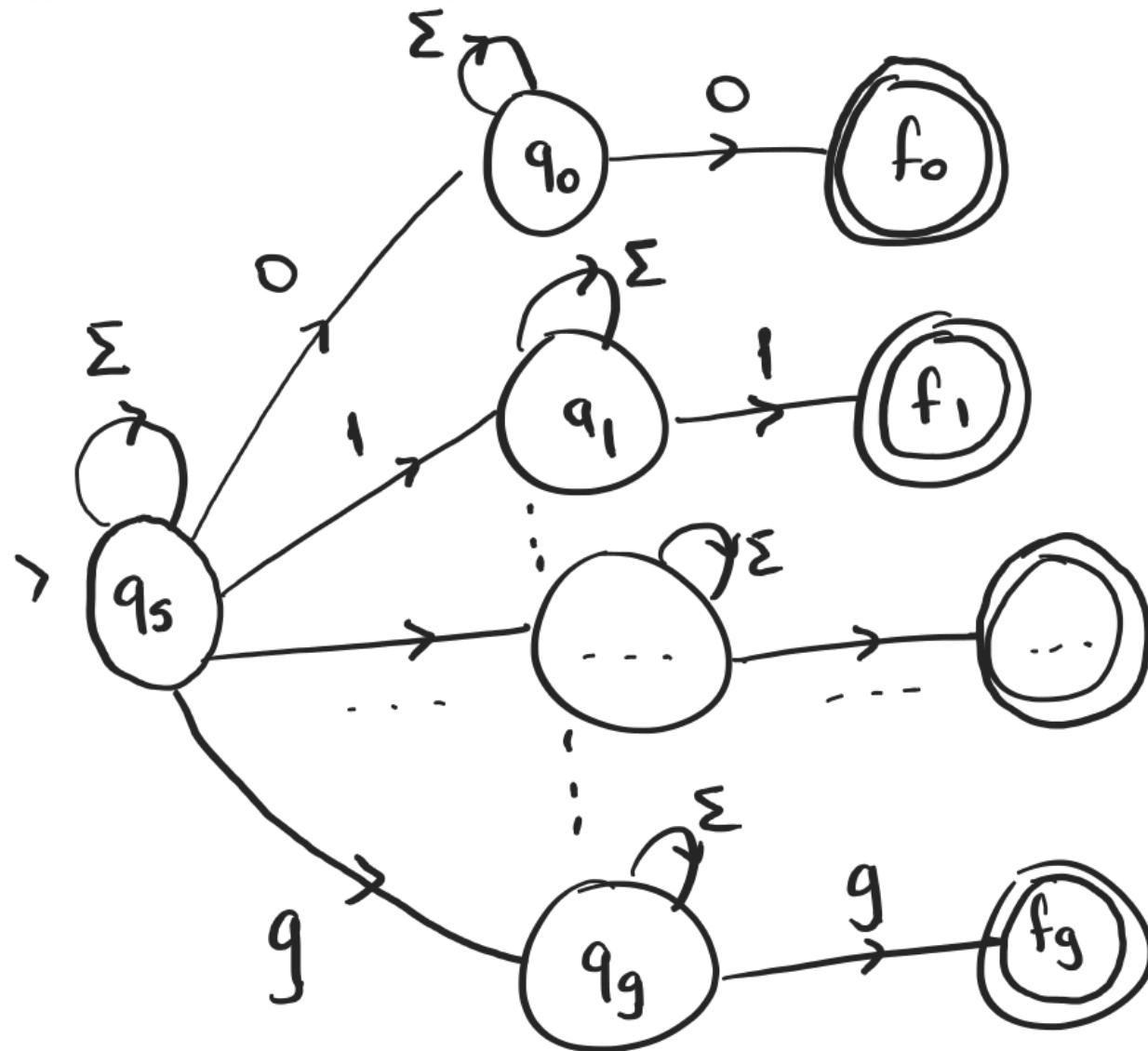
For the alphabet $\Sigma = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$, draw a DFA accepts the language $A = \{x \mid x \in \Sigma^* \text{ and } x \mid 3\}$.



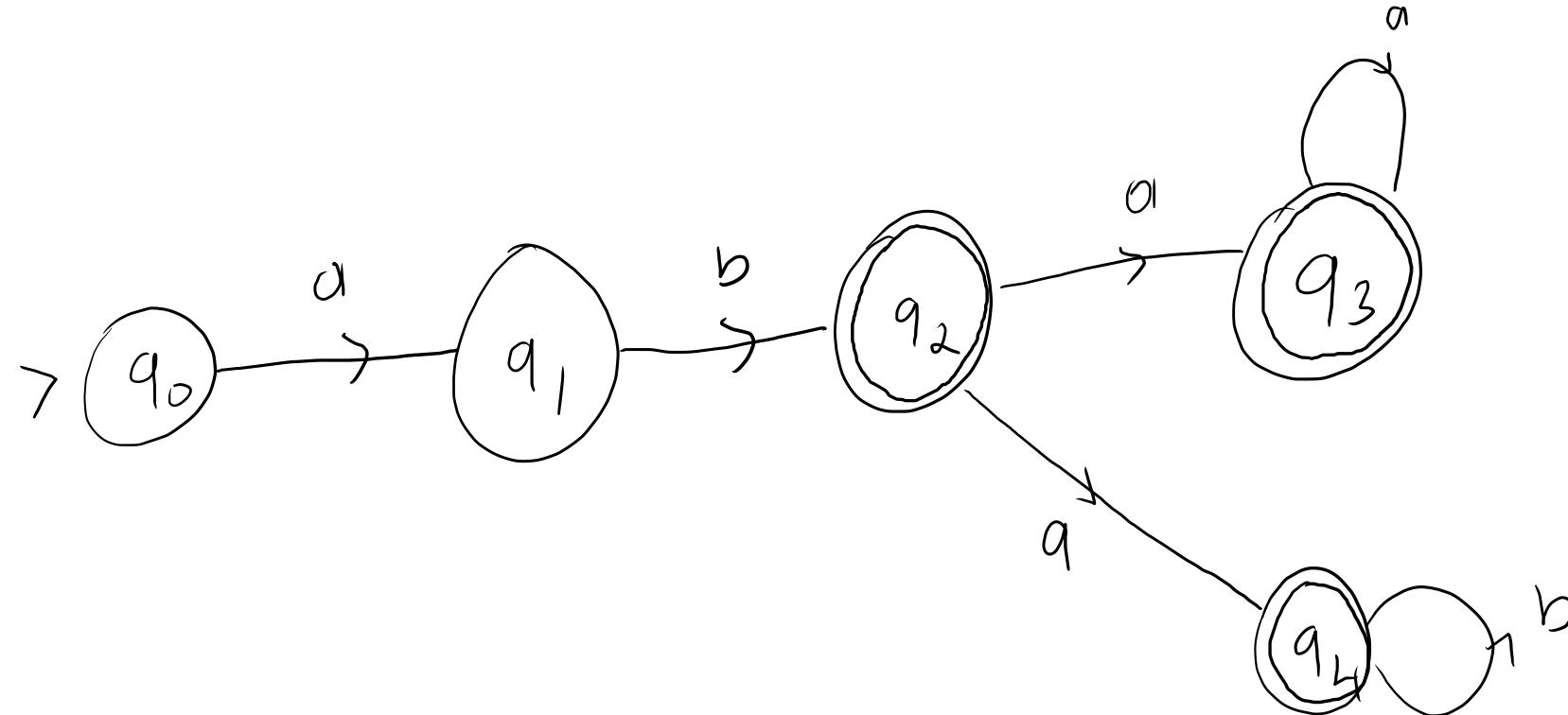
For alphabet $\Sigma = \{0, 1, 2\}$, design a DFA/NFA accepts all strings that includes "01", but does not include "20".



Design a DFA/NFA that accepts the set of strings over the alphabet $\Sigma = \{0, 1, 2, \dots, 9\}$ s.t. the final digit has appeared before.

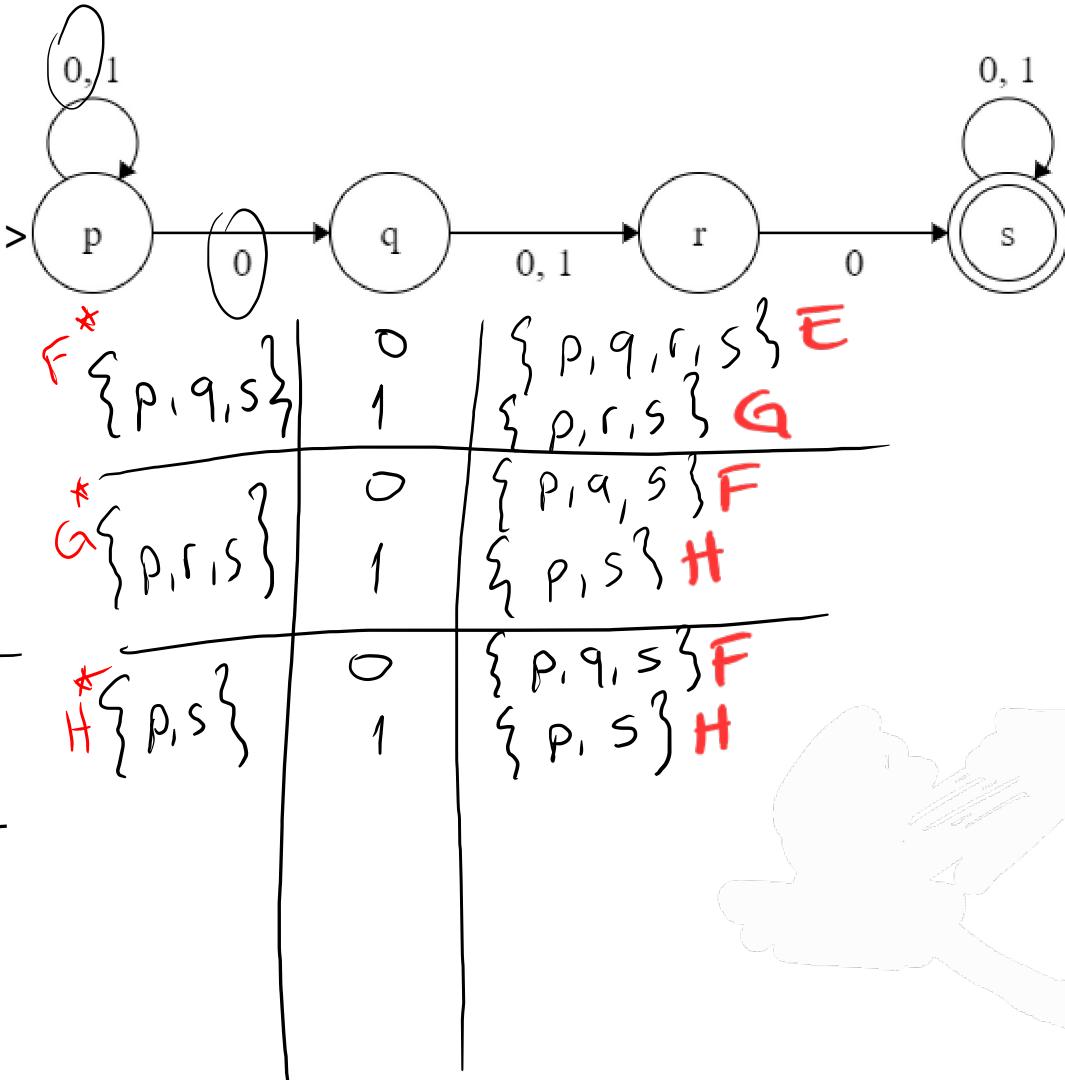


Create an NFA no more than 5 states that accepts the language
 $L = \{abab^n \mid n \geq 0\} \cup \{aba^n \mid n \geq 0\}.$

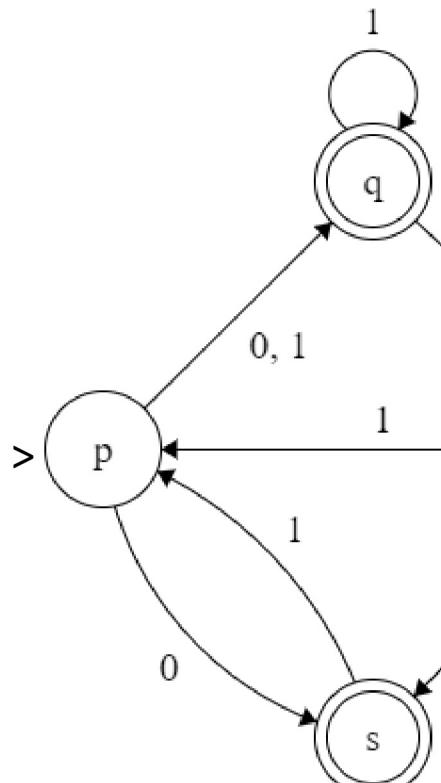


Convert to a DFA the following NFA:

A	P	0	$\{P, q\}$	B
	P	1	P A	
B	$\{P, q\}$	0	$\{P, q, r\}$	C
		1	$\{P, r\}$	D
C	$\{P, q, r\}$	0	$\{P, q, r, s\}$	E
		1	$\{P, r\}$	D
D	$\{P, r\}$	0	$\{P, q, s\}$	F
		1	P A	
E*	$\{P, q, r, s\}$	0	$\{P, q, r, s\}$	E
		1	$\{P, r, s\}$	G

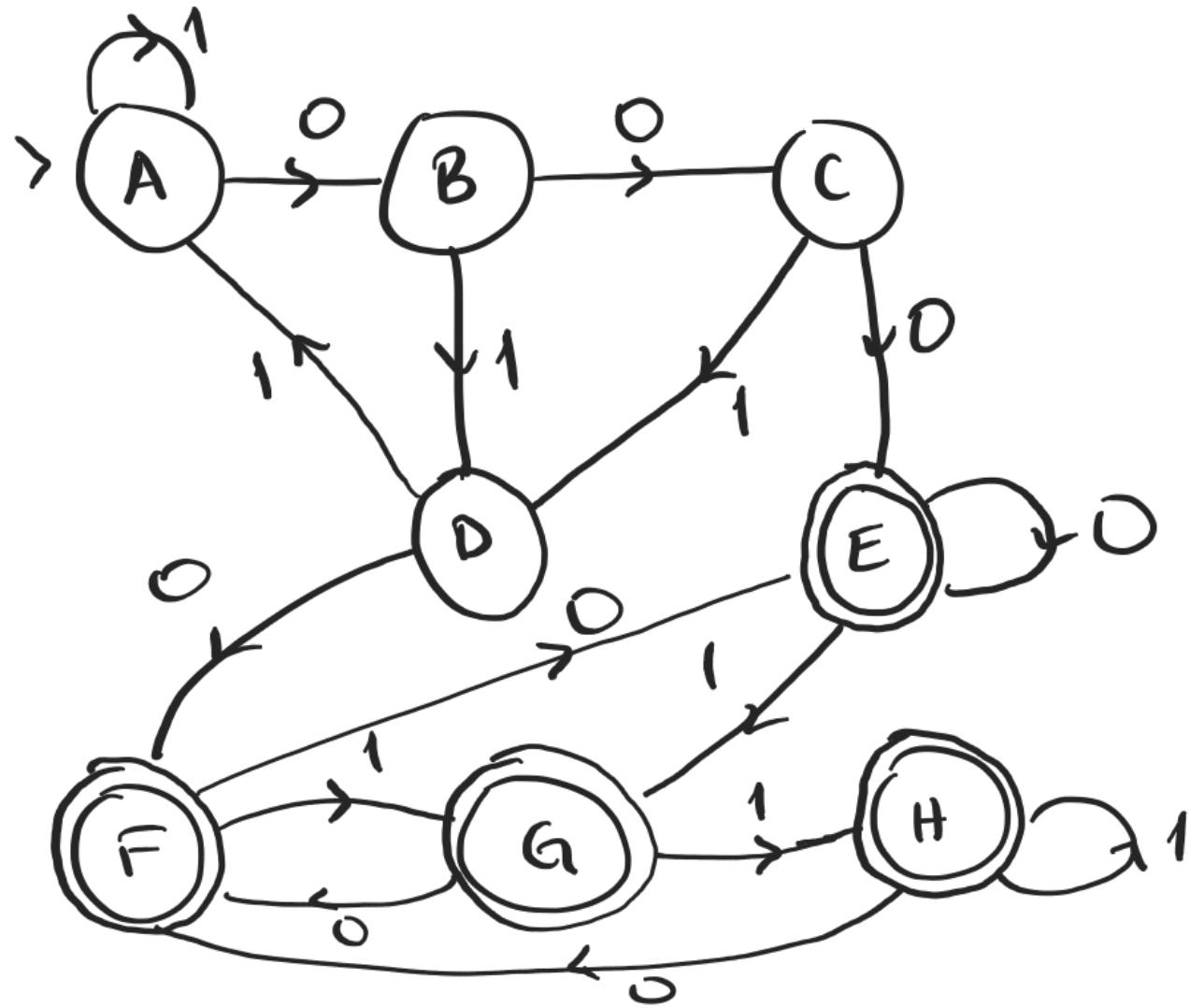


Convert to a DFA the following NFA:



A_p	0	$\{q, s\} B$		
	1	$q C$		
$B^* \{q, s\}$	0	$r D$		
	1	$\{p, q, r\} E$		
$C^* q$	0	$r D$		
	1	$\{q, r\} F$		
D_r	0	$S G$		
	1	$P A$		
$E^* \{p, q, r\}$	0	$\{q, r, s\} H$		
	1	$\{p, q, r\} E$		
$F^* \{q, r\}$	0	$\{r, s\} I$		
	1	$\{p, q, r\} E$		
$G^* s$	0	$\emptyset P$	A	
	1			
$H^* \{q, r, s\}$	0	$\{r, s\} I$		
	1	$\{p, q, r\} E$		
I^*	0			
	1			

Graphical Form of DFA in Problem 6



Problem 7:

