

Math 3342 Homework #5

Chapter 7 #1h, t

NFA for #1g

Extra problem #4

#1h $\{x \text{ contains } bab\}$ regex: $(a+b)^* bab (a+b)^*$

#1t

no two consecutive a's:

Almost the same as "every a is followed by b",
which would be $b^*(abb^*)^*$.

We also must include a as a special case.

$b^*(abb^*)^* + a$

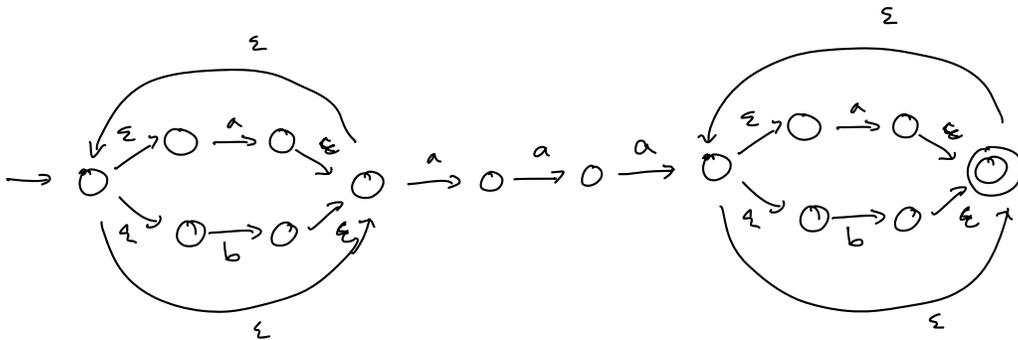
Another good answer:

$(ab+ab)^*(a+\epsilon)$

#1g

$(a+b)^* aaa (a+b)^*$

to NFA:



Extra #4

$\frac{d}{da} \{ x \text{ contains } aba \}$

if it looks like $a \dots aba \dots$, we get $\dots aba \dots$

if it looks like $aba \dots$, we get $ba \dots$

if it looks like $b \dots aba \dots$ it goes away

So the derivative is

$\{ x \mid x \text{ contains } aba \} \cup \{ bax \mid x \text{ is anything} \}$

another way to write it:

$\{ x \mid x \text{ contains } aba \text{ or starts with } ba \}$