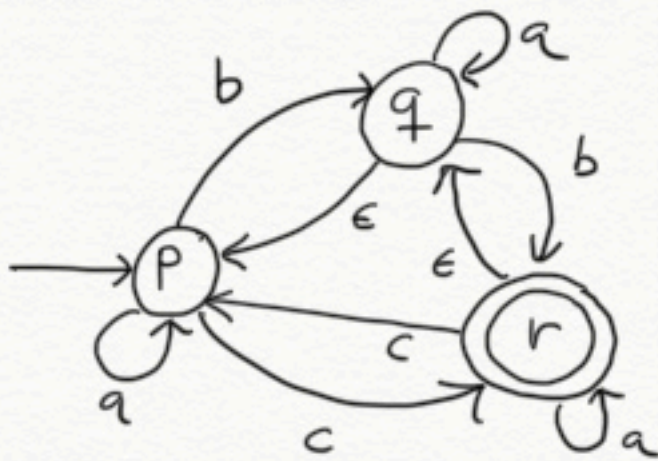


Exercise 2.5.1

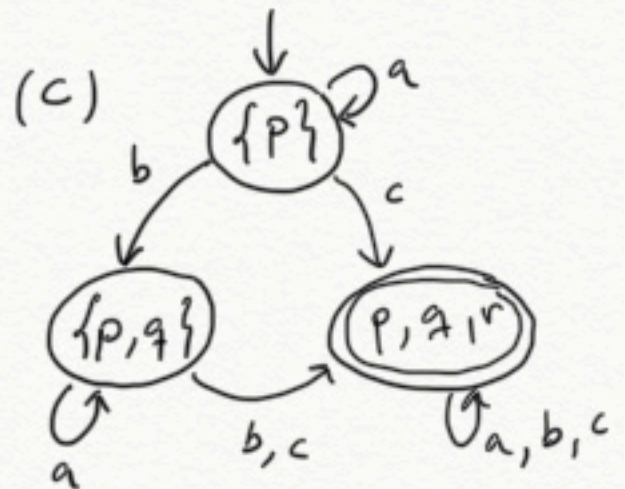


(a)

	ECLOSE
p	{p}
q	{q, p}
r	{r, q, p}

(b)

w	accept?
ϵ	x
a	x
b	x
c	✓
aa	x
ab	x
ac	✓
ba	x
bb	✓
bc	✓
ca	✓
cb	✓
cc	✓



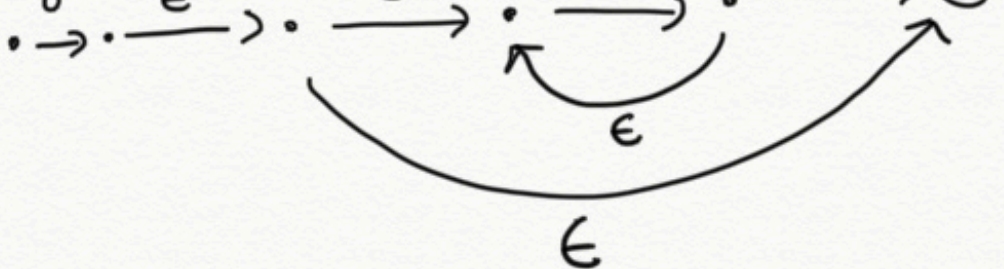
Exercise 3.2.4 (a)

$$0 \Rightarrow \bullet \xrightarrow{0} \odot$$

$$1 \Rightarrow \bullet \xrightarrow{1} \odot$$

$$1^* \Rightarrow \bullet \xrightarrow{\epsilon} \bullet \xrightarrow{1} \bullet \xrightarrow{\epsilon} \odot$$

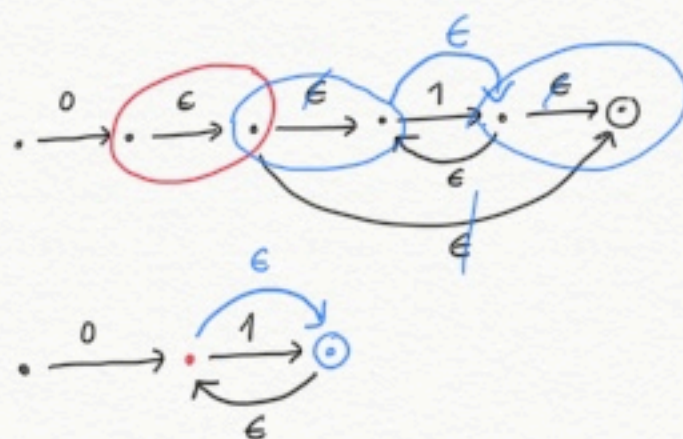

The diagram for 1^* shows a sequence of four states. The first state is a dot. An epsilon transition leads to a second dot state. From the second dot state, a transition labeled '1' leads to a third dot state. From the third dot state, an epsilon transition leads to a final state (a dot inside a circle). Additionally, there is a curved epsilon transition from the third dot state back to the second dot state, forming a loop.

$$01^* \Rightarrow \bullet \xrightarrow{0} \bullet \xrightarrow{\epsilon} \bullet \xrightarrow{\epsilon} \bullet \xrightarrow{1} \bullet \xrightarrow{\epsilon} \odot$$


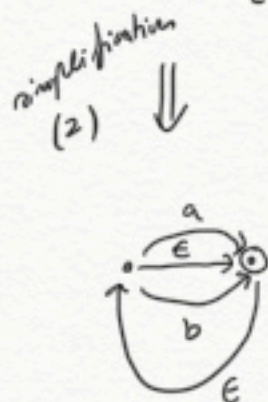
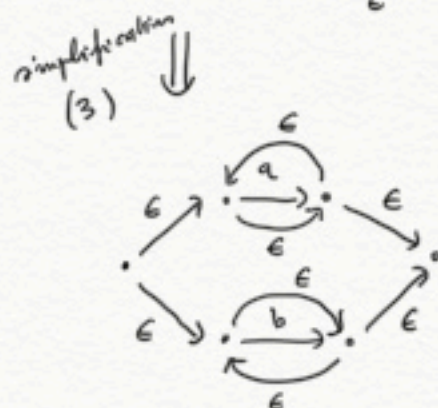
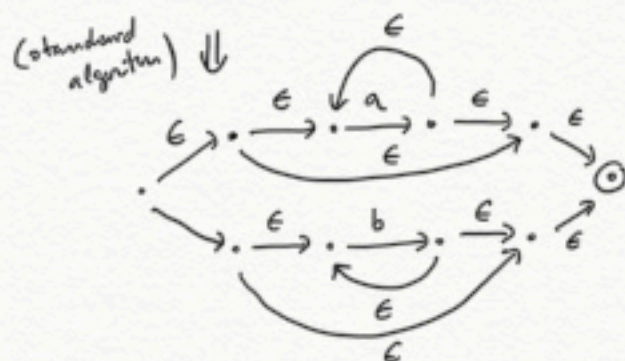
The diagram for 01^* shows a sequence of six states. The first state is a dot. A transition labeled '0' leads to a second dot state. From the second dot state, an epsilon transition leads to a third dot state. From the third dot state, another epsilon transition leads to a fourth dot state. From the fourth dot state, a transition labeled '1' leads to a fifth dot state. From the fifth dot state, an epsilon transition leads to a final state (a dot inside a circle). Additionally, there is a curved epsilon transition from the fifth dot state back to the fourth dot state, forming a loop.

Exercise 3.2.7 (b)

Applying simplifications (2) & (3) to 01^*

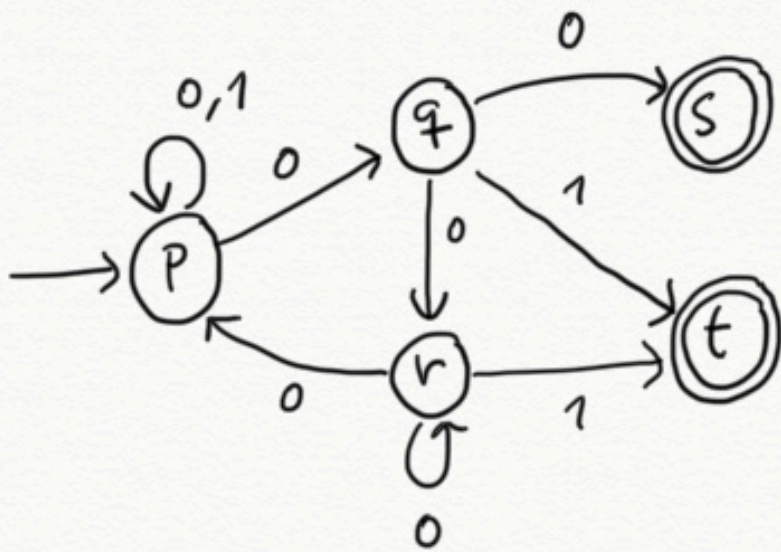


Example where simplification (1) & (3)
do not work well
 $a^* + b^*$

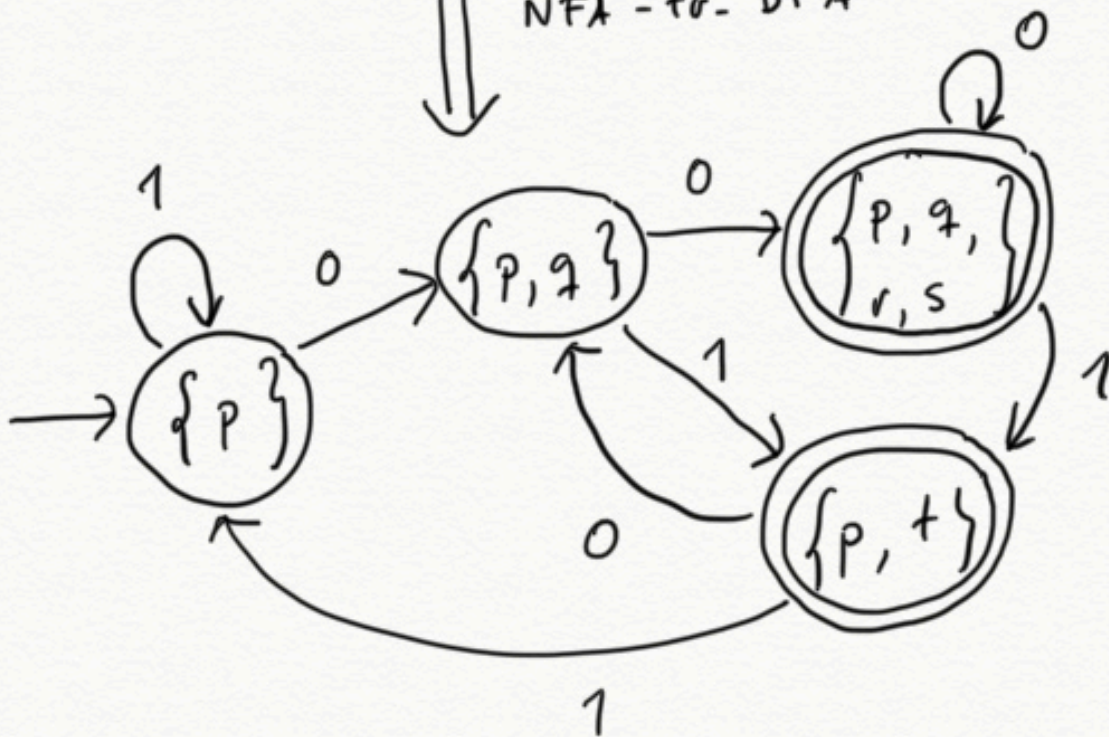


this is not $a^* + b^*$!
it is $(a+b)^*$

Exercise 2.3.3



NFA - to - DFA

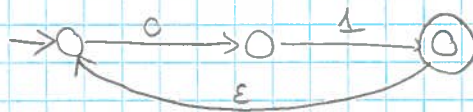


Strings of 0's and 1's that finish with
00 or 01

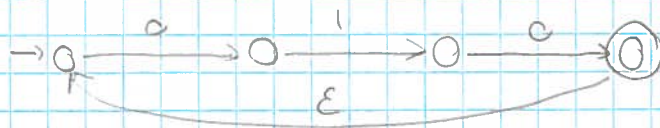
Exercise HMU 2.5.3 (b)

Design an ϵ -NFA for the set of strings consisting of either 01 repeated one or more times or 010 repeated one or more times.

The following ϵ -NFA will accept strings with 01 repeated one or more times:



The following ϵ -NFA will accept strings with 010 repeated one or more times:



For the combined language we therefore take

