

# CSCI 301 HW 6

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## Problem 1

a.

$$\begin{aligned} S &\rightarrow A \mid B \\ A &\rightarrow \epsilon \mid aAbb \\ B &\rightarrow aaab \mid aaaBb \end{aligned}$$

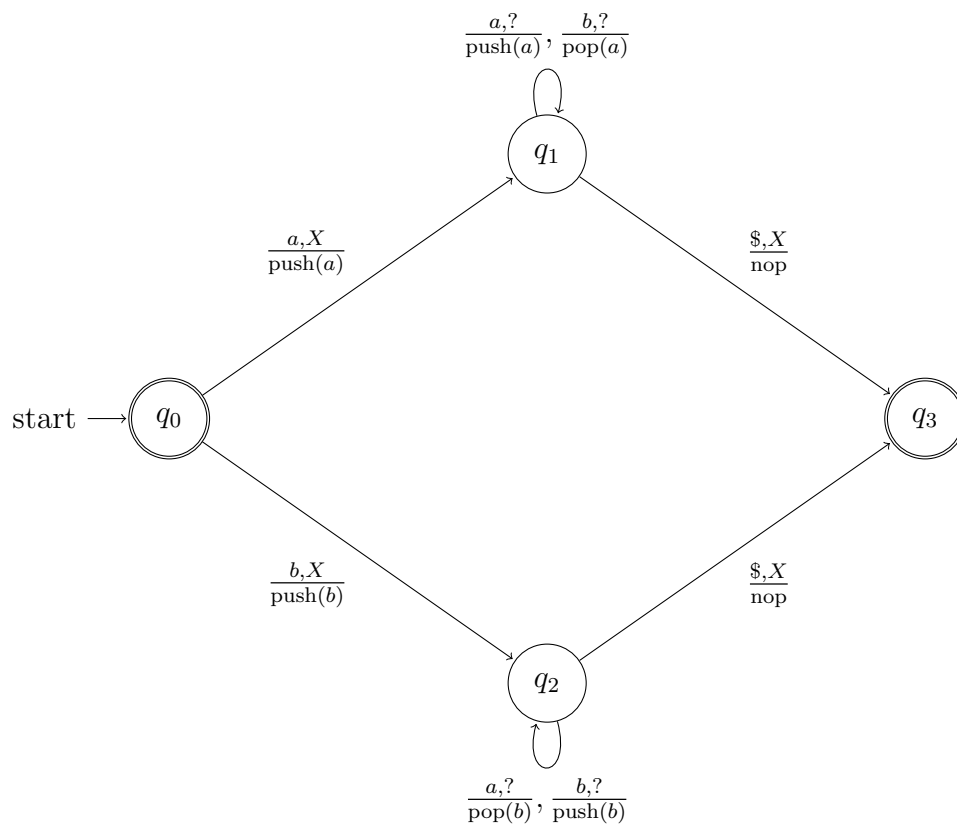
b.

$$\begin{aligned} S &\rightarrow aAB \\ A &\rightarrow \epsilon \mid aA \\ B &\rightarrow ab \mid aBb \end{aligned}$$

c.

$$\begin{aligned} S &\rightarrow \epsilon \mid aSb \mid bSa \\ S &\rightarrow abSba \mid baSab \end{aligned}$$

## Problem 2



### Problem 3

Derivation	Rule	Lookahead
$E \Rightarrow TR$	$E \rightarrow TR$	(
$TR \Rightarrow FVR$	$T \rightarrow FV$	(
$FVR \Rightarrow (E)VR$	$F \rightarrow (E)$	(
$(E)VR \Rightarrow (TR)VR$	$E \rightarrow TR$	(
$(TR)VR \Rightarrow (FVR)VR$	$T \rightarrow FV$	a
$(FVR)VR \Rightarrow (aVR)VR$	$F \rightarrow a$	a
$(aVR)VR \Rightarrow (aR)VR$	$V \rightarrow \Lambda$	+
$(aR)VR \Rightarrow (a + TR)VR$	$R \rightarrow +TR$	+
$(a + TR)VR \Rightarrow (a + FVR)VR$	$T \rightarrow FV$	a
$(a + FVR)VR \Rightarrow (a + aVR)VR$	$F \rightarrow a$	a
$(a + aVR)VR \Rightarrow (a + aR)VR$	$V \rightarrow \Lambda$	)
$(a + aR)VR \Rightarrow (a + a)VR$	$R \rightarrow \Lambda$	)
$(a + a)VR \Rightarrow (a + a) * FVR$	$V \rightarrow *FV$	*
$(a + a) * FVR \Rightarrow (a + a) * aVR$	$F \rightarrow a$	a
$(a + a) * aVR \Rightarrow (a + a) * aR$	$V \rightarrow \Lambda$	\$
$(a + a) * aR \Rightarrow (a + a) * a$	$R \rightarrow \Lambda$	\$