

CSE355 Fall 2016–Recitation Quiz 10 (Solutions)

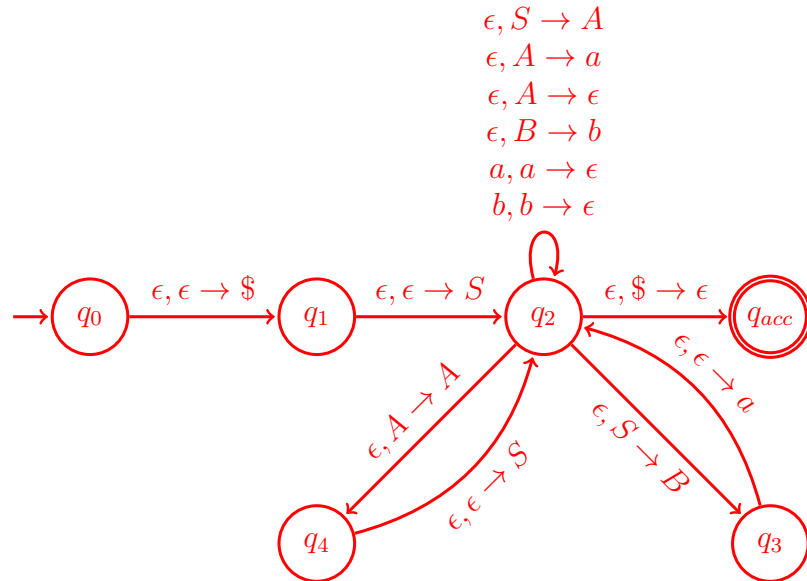
Name: _____ ASU ID: _____

Monday 9:40AM	Monday 10:45AM	Tuesday 7:30AM	Tuesday 4:35PM	Wednesday 9:40AM
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wednesday 10:45AM	Thursday 7:30AM	Thursday 4:35PM	Friday 9:40AM	Friday 10:45AM
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1. You are given the CFG $G = (\{S, A, B\}, \{a, b\}, R, S)$ with rules:

$$\begin{aligned}
 S &\rightarrow aB \mid A \\
 A &\rightarrow SA \mid a \mid \epsilon \\
 B &\rightarrow b
 \end{aligned}$$

Convert G to an equivalent PDA.



2. For the following, state True or False, and briefly explain your answer.

- (a) CFLs are not closed under intersection with *regular languages* (Hint: do DFAs use a stack?)
False. One can use a similar idea as the product construction for DFAs because DFAs are (informally) just PDAs that don't use the stack. This doesn't work for CFLs intersected with other CFLs because for their respective PDAs, they may have contradictory stack operations if we tried a product construction.
- (b) Suppose in the CFG \rightarrow PDA conversion that we pushed the RHS of each rule in *forwards* order (instead of backwards). If the original language was L , the new language is L^R (i.e., the reverse of every string in L).
True. We can see that if we did the "correct" conversion in reverse order from the PDA constructed (i.e., get the "intended" original CFG), if we originally had rule $A \rightarrow x$ (with $x \in (\Sigma \cup \Gamma)^*$), we would find rule $A \rightarrow x^R$. Therefore, we recognize the reverse of all the strings in L .

TA use only! Quiz has been recorded: