

Assignment 5

due Monday, November 20, 2023

- Use the pumping lemma to show that the following are not context free.
 - $A = \{ 0^n 1^n 0^n 1^n \mid n \geq 0 \}$
 - $B = \{ wtw^R \mid w, t \in \{0, 1\}^* \text{ and } |w| = |t| \}$
- Let $\Sigma = \{a, b, c, d\}$ and $C = \{ w \in \Sigma^* \mid \text{in } w, \text{ the number of } a\text{'s equals the number of } b\text{'s and the number of } c\text{'s equals the number of } d\text{'s} \}$. Show that C is not context-free.
- Consider the PDA described by the state diagram of figure 1 below.. Follow the method described the text to construct a CFG for the same language. Note:
 - follow the construction, do not just give a grammar independent of the machine
 - you can omit unnecessary variables (such as $A_{0,2}$)
 - the role of C on the stack is to satisfy feature 3 of the construction
- exercise 3.2(b,c) from text [same in 1st, 2nd, 3rd editions]

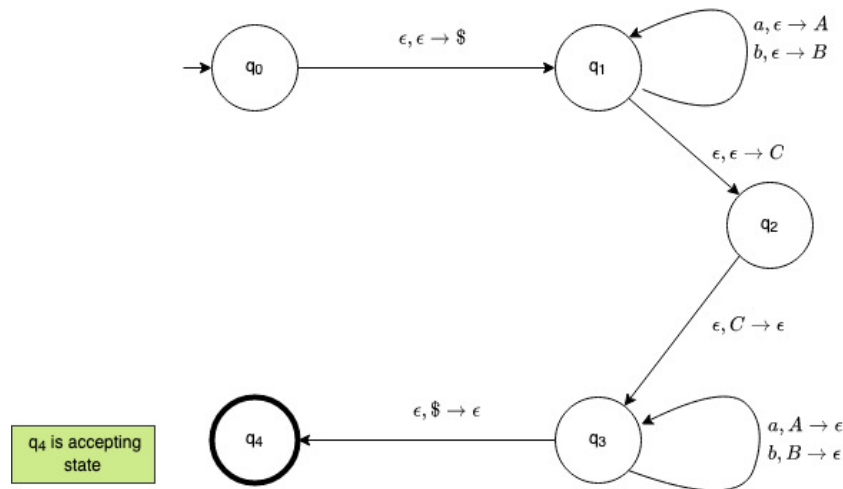


Figure 1: PDA for question 3