

CS21004, Tutorial 6

1. Consider a CFG $G = (\{S, A, B, C\}, \{a, b\}, S, P)$ with productions
 $S \rightarrow AB|BC$
 $A \rightarrow BA|a$
 $B \rightarrow CC|b$
 $C \rightarrow AB|a$

Using CYK algorithm check whether the string *baaba* is in $L(G)$.

2. Construct PDAs for the following:

a. $C = \{x\#y \mid x, y \in \{0, 1\}^* \text{ and } x \neq y\}$

b. $C = \{\text{bin}(i)\$reverse(\text{bin}(i+1)) \mid i \geq 0\} \subseteq \{0, 1, \$\}^*$. Here $\text{bin}(i) \in \{0, 1\}^*$ is the binary representation (without leading zero's) of the number i . Eg. $\text{bin}(11) = 1011$ and $reverse(\text{bin}(12)) = 0011$.

c. $C = \{w \in \{a, b, c\}^* \mid w \text{ does not equal } xcxc \text{ for some } x \in \{a, b\}^*\}$.