



Ma2201/CS2022
Quiz 0110

Foundations of C.S.

Spring, 2023

PRINT NAME: _____

SIGN: _____

1. (5 pts) Consider the grammar

$$\begin{aligned} G : S &\rightarrow AE \\ A &\rightarrow aa \mid abAba \\ B &\rightarrow ABa \mid CDa \\ C &\rightarrow Aa \mid bE \mid ACE \cdot \\ D &\rightarrow BCb \mid DEb \\ E &\rightarrow bbEbb \mid baAab \end{aligned}$$

Compute Reach and Term and to create an equivalent grammar with no useless symbols.

2. (5 pts) Consider the grammar given by

$$\begin{aligned} G : S &\rightarrow a \mid b \mid aaa \mid ABC \mid DE \\ A &\rightarrow b \mid B \mid aab \\ B &\rightarrow a \mid D \mid aba \\ C &\rightarrow b \mid a \mid abb \cdot \\ D &\rightarrow a \mid C \mid baa \\ E &\rightarrow b \mid C \mid bab \end{aligned}$$

On the back of this page, use CHAIN to find an equivalent grammar which has no chain rules.