CMPE 350 - Spring 2018

PS 6 - 19.03.18

2.26 Show that if G is a CFG in Chomsky Normal Form, then for any string $w \in L(G)$ of length $n \geq 1$, exactly $2n - 1$ steps are required for any derivation of w.

2.5 Give informal descriptions and state diagrams of pushdown automata for the languages in 2.4.

2.18 a) Let C be a context-free language and R be a regular language. Prove that the language $C \cap R$ is context-free.

b) Use part a) to show that the language $A = \{w | w \in \{a, b, c\}^*$ and contains equal number of a's, b's and c's$\}$ is not a CFL.

2.44 If A and B are languages, define $A \diamond B = \{xy | x \in A$ and $y \in B$ and $|x| = |y|\}$. Show that if A and B are regular languages, then $A \diamond B$ is CFL.

• Prove that there are infinitely many context-free languages which are non-regular.