

CSCI 450 Fall 2024
Homework 5

Problem 1: (4 pts) Are the following languages deterministic? Construct a DPDA if it is deterministic, otherwise, construct an NPDA.

1. $L_1 = \{a^n b^n : n \geq 1\} \cup \{a\}$
2. $L_2 = \{wcw^R : w \in \{a, b\}^*\}$

Problem 2: (2 pts) Based on the DPDA/NPDA you did above, use instantaneous descriptions to trace the string **aabb** for L_1 and **abcba** for L_2 .

Problem 3: (4 pts) Construct an NPDA corresponding to the grammar:

$S \rightarrow aABB \mid aAA$

$A \rightarrow aBB \mid a$

$B \rightarrow bBB \mid A$

(Hint: convert the above grammar to GNF first)