Homework 4:

Solve these questions by hand

Q1: Design a PDA that accepts the language$\{0^m\ 1^n 2^n\ 3^m | \ n \geq 1, m \geq 1\}$, Give context-free grammar that generate the same language. Apply three different examples using ID transitions

Q2: Design a PDA for accepting a language $\{0^n 1^m 0^n \mid m, n>=1\}$ give the ID form as we explain in the lecture. Apply the string "00011000" on this PDA using ID transitions.

Q3: Convert the following CFG to Chomsky Normal Form, write and explain all the steps you do.

1. $S \rightarrow ASA \mid aB$
   $A \rightarrow B \mid S$
   $B \rightarrow b \mid \varepsilon$

2. $S \rightarrow AbA$
   $A \rightarrow Aa \mid \varepsilon$