CSE 501/602 Homework 3

1. Show that the language $L = \{0^n 1^n 0^n\}$ where $n \geq 0$ is not regular.
2. Give CFGs for the following languages: over $\{a, b\}$:
   a. $L_1 = \{ w \mid w = a^n b^m \ m = 2n \}$
   b. $L_2 = \{ w \mid w = a^n b^m \ m < 2n \}$
3. Give a DETERMINISTIC pushdown automaton that recognizes all strings where the number of a's is exactly twice the number of $b's$.
4. Create the Pushdown Automaton directly from the following grammar:

$$S \rightarrow S \vee T \mid T$$

$$T \rightarrow T \wedge F \mid F$$

$$F \rightarrow p \mid \sim p$$