Automata Theory: Assignment 7
Due date: October 25 (Thursday)

Problem 1 (6 points)
Give a context-free grammar for each of the following languages:

(a) \( \{a^n b^{2n} : n \geq 0\} \)
(b) \( \{a^n b^m c^{n+m} : n, m \geq 0\} \)
(c) \( \{a^n b^m c^k : n + k \leq m \leq 2n + 2k\} \)

Problem 2 (4 points)
Consider the following grammar:

\[
S \rightarrow SA \mid A \\
A \rightarrow aAb \mid \lambda
\]

Show a left-most derivation, right-most derivation, and derivation tree for the string \( abaabb \).