1. Write an EBNF description of a C++ float literal.

2. Using the first grammar in the lectures, show a parse tree and a leftmost derivation for the following statement:
   \[ A = A \times (B \times C + A) \]

3. Show that the following grammar is ambiguous:
   \[
   \begin{align*}
       \langle S \rangle & \rightarrow \langle A \rangle \\
       \langle A \rangle & \rightarrow \langle A \rangle + \langle A \rangle \mid \langle \text{id} \rangle \\
       \langle \text{id} \rangle & \rightarrow \text{a|b|c}
   \end{align*}
   \]

4. Consider the following grammar:
   \[
   \begin{align*}
       \langle S \rangle & \rightarrow \text{a} \langle S \rangle \text{c} \langle B \rangle \mid \langle A \rangle \mid \text{b} \\
       \langle A \rangle & \rightarrow \text{c} \langle A \rangle \mid \text{c} \\
       \langle B \rangle & \rightarrow \text{d} \mid \langle A \rangle
   \end{align*}
   \]
   Which of the following sentences are in the language generated by the grammar? Show your work
   
   a. abcd
   b. accbd
   c. acbccc
   d. acd
   e. accc

5. Write a grammar for the language consisting of strings that have \( n \) copies of the letter A followed by the same number of copies of the letter T, where \( n > 0 \). For example, the empty string,
   \[ \text{AT}, \]
   \[ \text{AATT}, \]
   \[ \text{AAAAAAAAATTTTTTTT} \]
   will be in the language but A, AAT, TTTT are not.