1. Design a context-free grammar for $\{a^i b^j c^k | i \neq j \text{ or } j \neq k\}$, that is, the set of strings of a's followed by b's followed by c's, such that there are either a different number of a's and b's or a different number of b's and c's, or both.

2. Design a context-free grammar for the set of all strings with twice as many 0's as 1's.

3. Design a context-free grammar for the language consisting of all strings over $\{a, b\}$ that are **not** of the form ww, for some string w. Explain how your grammar works. You needn't prove it's correctness formally.

4. Design a PDA to accept the set of all strings of 0's and 1's such that no prefix has more 1's than 0's.

5. Design a PDA to accept: $\{0^n 1^m | n < m < 2n\}$. You may accept either by final state or by empty stack, whichever is more convenient.