## Lista de Exercícios de Gramática Livre de Contexto

$$\begin{split} L_1 &= \left\{ a^n b^n \, / \, n \geq 0 \right\} \\ L_2 &= \left\{ a^n b^m c^n \, / \, n > 0, \, m > 0 \right\} \\ L_3 &= \left\{ a^n b^{2n} \, / \, n > 0 \right\} \\ L_4 &= \left\{ a^{2n} b^n \, / \, n \geq 0 \right\} \\ L_5 &= \left\{ a^n b^m c^m d^n \, / \, n \geq 0 \, e \, m \geq 0 \right\} \\ L_6 &= \left\{ w \, \epsilon \, \left\{ a, b \right\}^* \, / \, |w|_a = |w|_b \right\} \\ L_7 &= \left\{ a^n b^{3m} c^m d^{2n} \, / \, n \geq 0 \, e \, m \geq 0 \right\} \\ L_8 &= \left\{ a^i b^j c^k \, / \, i = j + k, \, e \, j \geq 0 \, e \, k \geq 0 \right\} \\ L_9 &= \left\{ a^i b^j c^k \, / \, k = i + j, \, i \geq 0, \, j \geq 0 \right\} \\ L_{10} &= \left\{ a^i b^j c^k \, / \, j = i + k, \, j \geq 0, \, k \geq 0 \right\} \\ L_{11} &= \left\{ a^n b^n c^m d^m \, / \, n \geq 0, \, m \geq 0 \right\} \\ L_{12} &= \left\{ a^n b^{2n+1} \, / \, n > 0 \right\} \\ L_{13} &= \left\{ a^n b^{2n+2} \, / \, n > 0 \right\} \\ L_{14} &= \left\{ a^n b^{n/2} \, / \, n > 0 \, e \, n \, \acute{e} \, m \acute{e} \, lmpar \right\} \\ L_{15} &= \left\{ a^n b^{n/3} \, / \, n > 0 \, e \, n \, \acute{e} \, m \acute{e} \, lmpar \, e \, |w|_b \, \acute{e} \, mpar \right\} \\ L_{17} &= \left\{ w \, \epsilon \, \left\{ a, b \right\}^* \, / \, |w|_a \, \acute{e} \, par \, e \, |w|_b \, \acute{e} \, par \right\} \end{split}$$