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CNC - Formal Languages
Homework 5

9. Construct a grammar over {a, b, c} whose language is { $a^n b^m c^i \mid 0 \leq n + m \leq i$ }.

S -> aSc | A | λ
A -> bAc | B
B -> cC | λ

11. Construct a grammar over {a, b} whose language is { $a^m b^i a^n \mid i = m + n$ }.

S -> LS | LSR | SR | λ
L -> ab | aLb
R -> ba | bRa

Find a CFG over {a,b} that generates the language consisting of strings that have twice as many a's as b's and prove your grammar correct.

S -> Bbaa | bBaa | baBa | baaB | Baba | aBba | abBa | abaB | Baab | aBab | aaBb | aabB
B -> S | λ