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Automata Theory
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Homework # 16

(1) Create an unrestricted grammar to describe the language **L = { 0a1b2ab | a,b ≥ 1 }** For strings in this language, the number of 2's is equal to the product of the number of 0's and the number of 1's.

UG

S A B C X L T J

---

0 1 2

S

S,BS

S,X

X,AX

X,T

BA,ABC

CA,AC

CB,BC

CT,T2

BT2,BL2

BL,L1

AL1,AJ1

AJ,J0

J,e

This unrestricted grammar produces all strings in form { 0a1b2ab | a,b ≥ 1 }

(2) Create an unrestricted grammar to describe the language **L = { w ∈ {1}* | |w| = 2k, k ≥ 0 }**

UG

S A L F T R

1

S

S,TX
X,AX
X,LF
AL,L1
TL,R
R1,11R
RF,e

This unrestricted grammar produces all strings in form{ w ∈ {1}* | |w| = 2^k, k ≥ 0 }