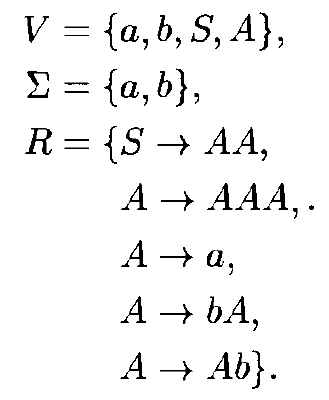
Homework – 5

1. Consider the grammar , where



a). Give a string of that can be produced by applying the rules at most 4 times

answer:

S->AA

A->a (aA)

A->bA (abA)

A->a (aba)

So, after four times, the final string is aba

b). Same string can be derived in different ways, e.g., , . Give at least 2 distinct derivations for the string

answer:

S->AA

A->bA (bAA)

A->bA (bAbA)

A->bA (bAbbA)

A->Ab (bAbbAb)

A->a (babbAb)

A->a (babbab)

c). For any , describe a derivation in of the string

answer:

S -> AA

by m applications of rule A -> bA (

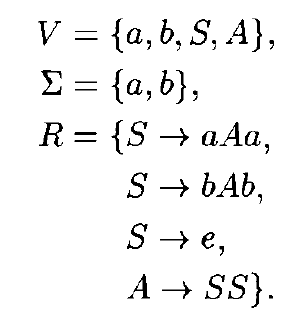
A -> a (

by n applications of rule A -> bA (

by p applications of rule A -> Ab (

by rule A -> a ()

1. Consider the grammar , where



Give a derivation of the string in .

Answer:

S->bAb

A->SS (bSSb)

S->aAa (baAaSb)

S->bAb (baAabAbb)

A->SS (baSSabSSbb)

S->e (baabbb)

1. Show that the following languages are context-free by exhibiting contextfree grammars generating each.

a).

answer:

S->aAb

S->e

A->aS

A->SS

b).

answer:

S->aAc

A->aAc

A->bBc

B->bBc

B->e