

1 Finite State Tree Automata (FSTA)

Consider the following FSTA:

$\Sigma = \{g, b, i, r, a, x\}$

$Q = \{g, b\}$

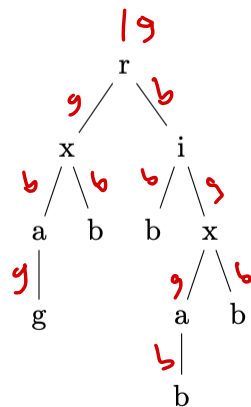
$F = \{g\}$

$\Delta = \{$

$([g,g], i, g), ([g,b], i, b), ([b,g], i, b), ([b,b], i, b),$
 $([g,g], r, g), ([g,b], r, g), ([b,g], r, g), ([b,b], r, b),$
 $([g,g], x, b), ([g,b], x, g), ([b,g], x, g), ([b,b], x, g),$
 $([g], a, b), ([b], a, g),$
 $([], g, g), ([], b, b)$

$\}$

Does the grammar above generate the following tree?



generated since b is a final state?

What does the grammar above remind you of? What is the treeset generated by the grammar?

.

and, or, and, not operators

Let M be the FSTA

$([a, b], [T, F, P, M, C, D, Lt, If, 0, 1, 2, 3], [a, b], \Delta)$

where

$\Delta = \{$
 $([], T, b), ([], F, b),$
 $([], 0, a), ([], 1, a), ([], 2, a), ([], 3, a),$
 $([a, a], P, a), ([a, a], M, a),$
 $([b, b], C, b), ([b, b], D, b),$
 $([a, a], Lt, b),$
 $([b, b, b], If, b), ([b, a, a], If, a)$
 $\}$

For each tree t below, determine whether $\text{under}_M(t)(a)$ is true and whether $\text{under}_M(t)(b)$ is true.

$\text{under}(T)(a) = [], T, a ?$

$\text{under}(0(T, F))(a) = [dcl]$

both 0
for a,b
if true
can't be
generate

at most
1 level

state $b = 1$
state $a = 0$

can't
be
generated

false for
both

state $b = 1$ true
state $a = 0$ false

state $a = 1$ true
state $b = 0$ false

state $a = 1$ true
state $b = 0$ false

can't be
generated
false for
both

false for
both