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CSCI 3155

3/1/2015

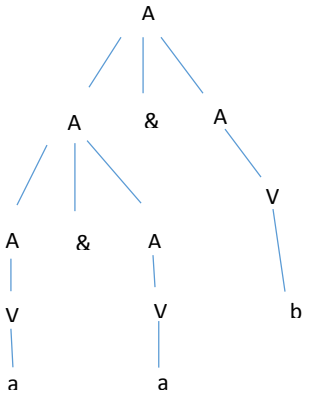
Lab 2 Write Up

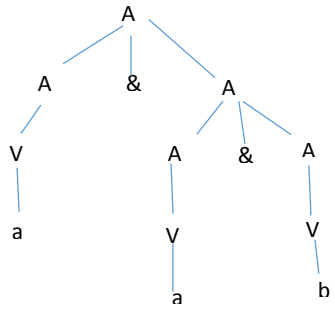
2 .

a. $\dfrac{}{a \in VObjects} \quad \dfrac{}{b \in VObjects}$

$$\frac{A_1 \in AObjects \quad A_2 \in AObjects}{A_1 \& A_2 \in AObjects} \quad \frac{V \in VObjects}{V \in AObjects}$$

b. "a & a & b"





c. S cab either be a string of one or more a's, a null terminated string of zero or more b's, or a string of one or more c's. → a*|b*ϵ|c*

d.

i. "baab" → Yes

$$\frac{\dfrac{\dfrac{}{b \in AObjects}}{b \in SObjects} \quad \dfrac{}{a \in SObjects} \quad \dfrac{\dfrac{}{a \in BObjects}}{a \in SObjects} \quad \dfrac{}{b \in SObjects}}{baab \in SObjects}$$

ii. No

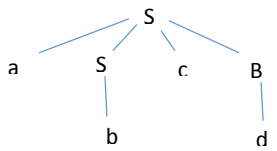
iii. No

iv. "bbaab" → Yes

$$\frac{\dfrac{\dfrac{\dfrac{}{b \in AObjects} \quad \dfrac{}{b \in AObjects}}{bb \in AObjects}}{bb \in SObjects} \quad \dfrac{}{a \in SObjects} \quad \dfrac{\dfrac{}{a \in BObjects}}{a \in SObjects} \quad \dfrac{}{b \in SObjects}}{bbaab \in SObjects}$$

e.

i. “abcd” → Yes

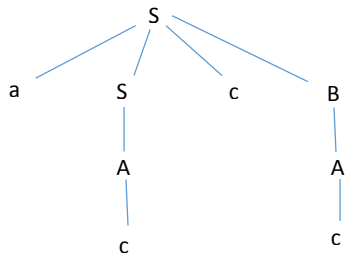


ii. No

iii. No

iv. No

v. “accc”→ Yes



3.

a.

i. The first grammar is a left most expansion of an unambiguous grammar where operator precedence doesn’t matter and terminates on an operand.
Operand^{+}(operator operand)*
The second grammar is a right most expansion of an unambiguous grammar where operator precedence doesn’t matter and terminates on a NULL.
Operand^{+}(operator operand)*

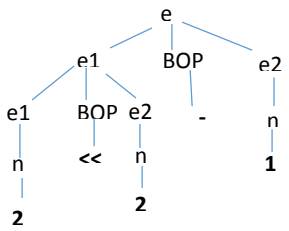
ii. They generate the same expressions since both require at least one operand, followed by one or more parings of operator operand expressions, terminating on an operand.

b.

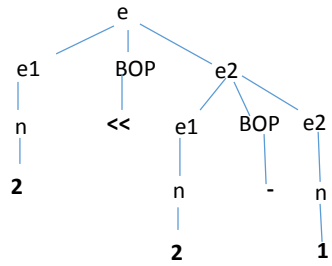
“2 << 2 -1”

(2<<2)-1 2 << (2-1)

"(2 << 2) – 1" :



"2 << (2 – 1)":



The expression evaluated to 4, therefore the correct expression would be "2 << (2 - 1)", or the second syntax tree. Since 2 << 1 = 4, this implies that "2 -1" is evaluated first, or "-" has higher precedence to "<<".

c. E ::= 0.Z|-0.CG|-A.CG|-B.ZG|A.CG|B.ZG|B.ZG|0.CG|.Z
A ::= An|n|ϵ |nZA
Z ::= Z0|0
C ::= ZC|n|nC|CZ|nZ
B ::= BZ|n|nC|CZ|nZ
G ::= EB|ϵ
n ::= 1|2|3|4|5|6|7|8|9