Julia Nelson Quiz 2

## Question 7

$S \rightarrow aST \mid b$

$T \rightarrow a \mid b \mid \epsilon$

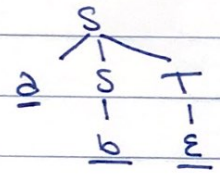
Root = S

Vertex NonTerm
Leaf Terminate

A grammar is unambiguous if there only exist 1 parse tree and ambiguous with more than 1 parse tree

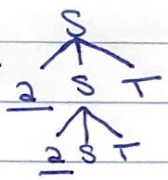
lets considering the string input ~~aaabbb~~ ab

P1



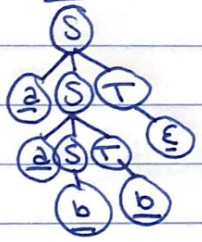
P2

DOESNT WORK



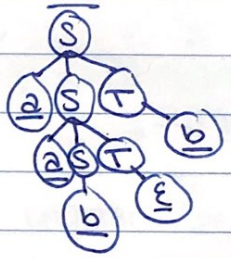
Now lets considering string aabb

P1



→ aabbε

P2



→ aabεb

SAME happens with other strings like aaabbb and string aaabab

Because this grammar generates String aabb that has more than 1 parse tree therefore it is an ambiguous grammar.

Julia Nelson

Question 6 $L = \{0^i 1^j, i \text{ is even} \Rightarrow i > j\}$

Assume L is Regular

let there exis a pumping length P such that

$|s| \geq P$ $xy^i z \in L$ for $i \geq 0$

$|y| > 0$

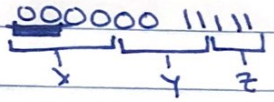
$|xy| \leq P$

$|s| \geq P$ $s = 0^{P+1} 1^P$ ← Because $i > j$

let $P = 5$

$s = 000000\,11111 = 0^6 1^5$ : $i$ is even = 6 and $i > j$ $6 > 5$

Split into $xyz$




{Trying to show $xy^i z \notin L$ for some $i$}

$x = 0000$

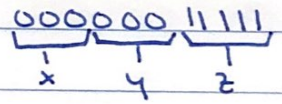
$y = 0011$

$z = 111$

let $i = 3$

0000 0011 0011 0011 111

Does not exist in L

let 


$x = 000$

$y = 000$

$z = 11111$

$|xy| \leq P$ ?

$|3+3| \leq P$ ?

$6 \leq P = 5$ X

Does NOT satisfy $|xy| \leq P$

~~let 000000 11111~~

Because to be regular the Pumping lemma must satisfy the rules and by contradiction L is NOT Reg