

Context Free Language Part-1

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Content :

1. CFG

Context free grammar(CFG): It is type 2 grammar.



PDA:- Push down automata is a acceptor of CPG.

G:- (V, T, S, P)

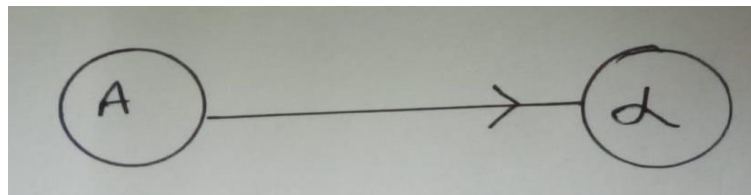
V:- Set of non-terminals(capital letter)

T:- Set of terminals(small letter)

S:- Starting symbols

P:- Production rules

CFG is of the form:-



Single non terminal symbol

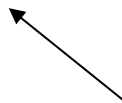


set of terminal or non-terminal

$S \rightarrow Aab$



Single NT



Set of T or NT

Eq :-

$S \rightarrow Aab$

$A \rightarrow a/b/\wedge$

Q.

$S \rightarrow aX$

$X \rightarrow aX/ bX/ \wedge$

aaX, abX, ab

$S \rightarrow a$

$S \rightarrow aa$



$S \rightarrow ab$

$S \rightarrow aaa$

$S \rightarrow abb$

→ write a CFG for strings ending with a.

$S \rightarrow aX$

$X \rightarrow aX / bX / \Lambda$

→Write a CFG for the strings having at least one aa,

$S \rightarrow Xaa X$

$X \rightarrow aX / bX / \Lambda$

→Write a CFG of string having at least two aa

$S \rightarrow XaXaX$

$X \rightarrow aX / bX / \Lambda$

→write a^*bb

$S \rightarrow Xbb$

$X \rightarrow aX / \Lambda$



Q. $S \rightarrow aS / bS / \Lambda$

Which of the following would be derived from the above production rule.

1 aaa ba

2 aabab

3 aabba

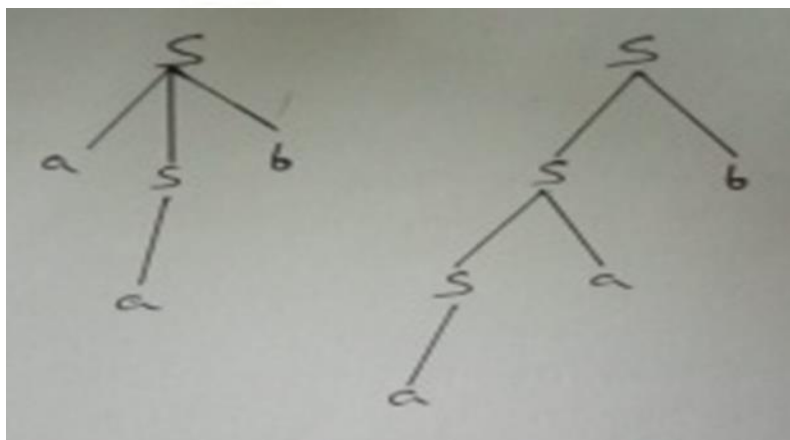
4 aabbb

Ambiguous & Non - Ambiguous Grammar :

If a same string can be generated by different parse trees then grammar is called as Ambiguous else it is un - ambiguous

For example :-

$S \rightarrow aSb / Sb / Sa / a$



Q.

G1 :

$S \rightarrow AB / aaB$

$A \rightarrow a / Aa$

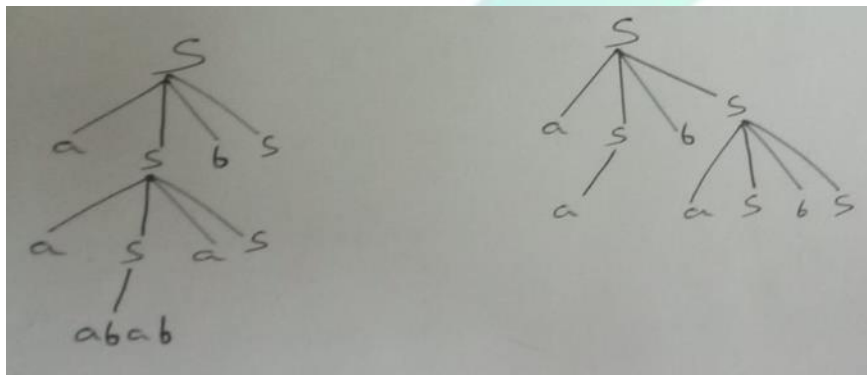
$B \rightarrow b$

G2 :

$S \rightarrow aSb / bSa / \Lambda$

→ write of the following is ambiguous :

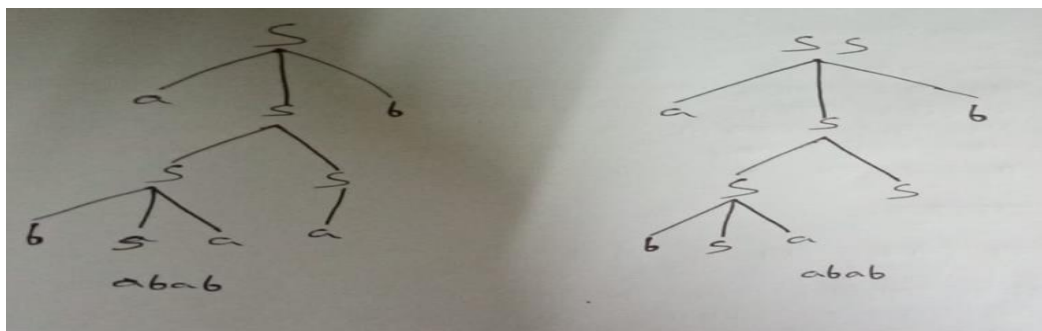
1. G1 2. G2 3. Both 4. Both not

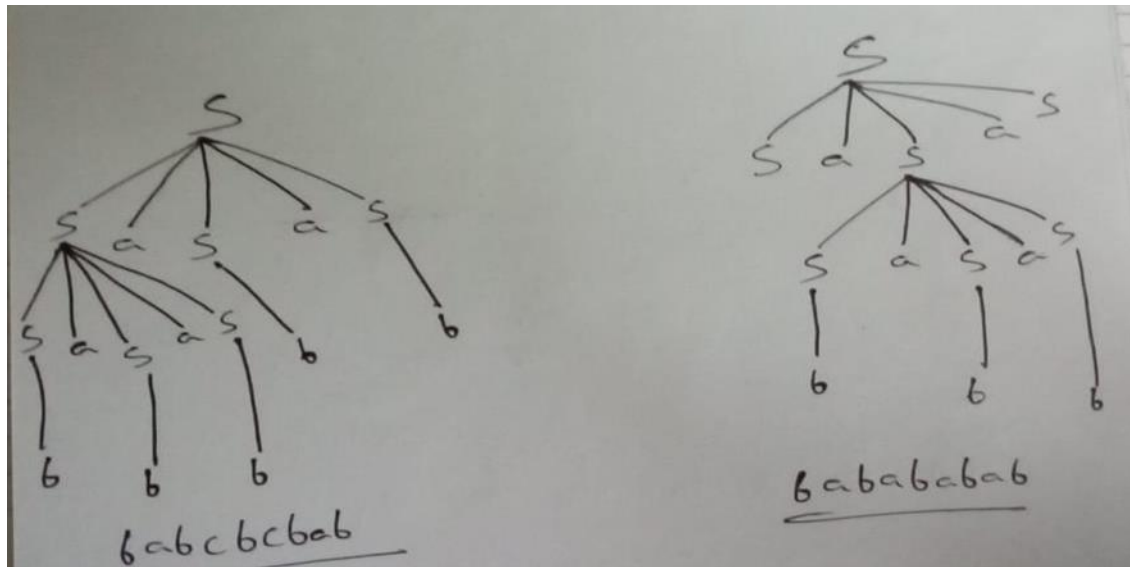


Q. The Grammar $S \rightarrow aSb / bSa / ss / \Lambda$ is ambiguous

→ True

→ False






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