Relationship

Learn Vid Fun....

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Left Recursion, Left factoring & Ambiguity

have

No Relation

with each other

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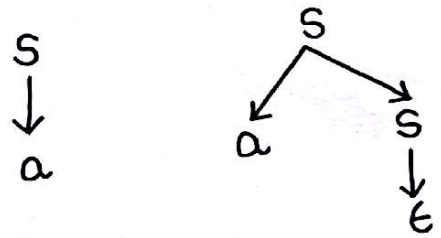
Ambiguous Grammar with Left Factoring

Consider the grammar -

$$S \rightarrow aS / a / \epsilon$$

Two parse trees exist for the string $w = a$



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Unambiguous Grammar with Left factoring

Consider the grammar-

$$S \rightarrow aA / aB$$

$$A \rightarrow a$$

$$B \rightarrow b$$

$$L(G) = \{ aa / ab \}$$

Unique parse trees exist for both the strings

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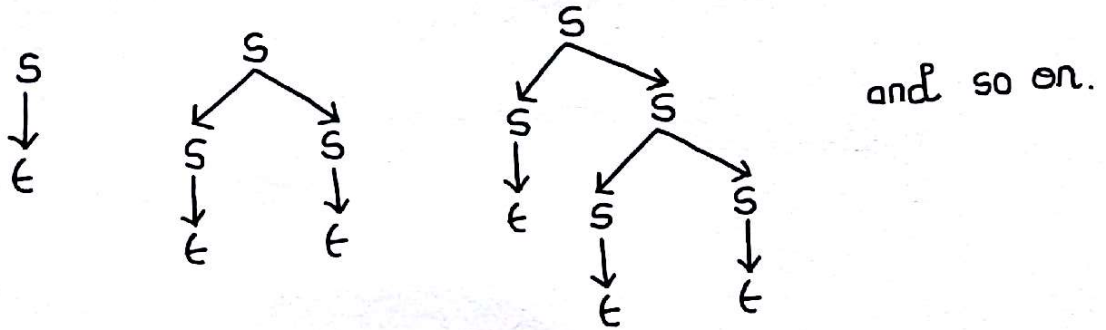
Ambiguous Grammar with Left Recursion

Consider the grammar -

$$S \rightarrow SS / \epsilon$$

Infinite parse trees exist for the string $w = \epsilon$



and so on.

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Unambiguous Grammar with Left Recursion

Consider the grammar-

$$S \longrightarrow Sa \mid \epsilon$$

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Ambiguous Grammar without Left Recursion & without Left Factoring

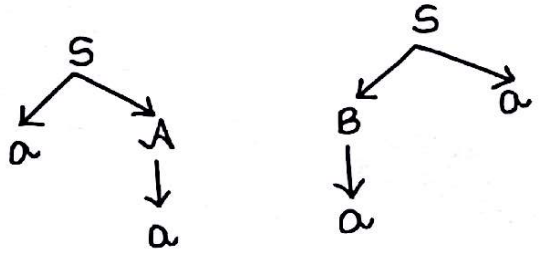
Consider the grammar -

$S \rightarrow aA/Ba$

$A \rightarrow a$

$B \rightarrow a$

Two parse trees for $w = aa$



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Unambiguous Grammar with both left recursion and left factoring

Consider the grammar-

$S \rightarrow Sa/\epsilon/bB/bD$

$B \rightarrow b$

$D \rightarrow d$

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