

## Experiment 4

Ex: eliminate left recursion & left factoring

$$G \Rightarrow \begin{aligned} E &\rightarrow E + T \mid T \\ T &\rightarrow T * F \mid F \\ F &\rightarrow (E) \mid id \end{aligned}$$

Sol<sup>n</sup> (i) Identify the Recursion.

if given  $G$  contains  $A \rightarrow A \alpha$   
 $A \rightarrow A B$

as this  $G$  contains left recursion.

i.e.,

$$E \rightarrow E + T \mid T \rightarrow \textcircled{1}$$

$$T \rightarrow T * F \mid F \rightarrow \textcircled{2}$$

to remove this add  $E'$  &  $T'$  to the given grammar.

(ii) Identify the left factoring.

if given  $G$  contains  $A \rightarrow \alpha_1 A$   
 $A \rightarrow \alpha_2 A$

as this  $G$  doesn't contain left factoring  
final  $G$  is,

$$E \rightarrow T E'$$

$$E' \rightarrow + T E' \mid \epsilon$$

$$T \rightarrow F T'$$

$$T' \rightarrow * F T' \mid \epsilon$$

$$F \rightarrow (E) \mid id. //$$