



W

E

L

C

O

M

E



Maksudul Hasan Limon
Student, Department of
CSE
ID 41230201219



Minhaz Ahmed
Student, Department of
CSE
ID 41230201227



Md.Shakil Rana
Student, Department of
CSE
ID 41230201235



Abu Yusuf Rafi
Student, Department
of CSE
ID 41230201247



Israt Jahan Ema
Student, Department
of CSE
ID 41230201283




Today's Topic

Conversion of CFG to CNF



Contents

- 1. Remove ϵ -productions (Step 1)**
 - 2. Remove unit productions (Step 2)**
 - 3. Remove terminals in long productions (Step 3)**
 - 4. Convert long productions to binary productions (Step 4)**
- 

Step 1

Remove Null Production

Remove ϵ -productions and add alternatives without nullable variables.

Before:

$S \rightarrow ABe \mid DAB$

$A \rightarrow a \mid \epsilon$

$B \rightarrow b$

$D \rightarrow C \mid d$

$C \rightarrow \epsilon$

After:

$S \rightarrow ABe \mid Be \mid DAB \mid AB \mid DB \mid B$

$A \rightarrow a$

$B \rightarrow b$

$D \rightarrow d$

Step 2

Remove Unit Production

Replace rules like $A \rightarrow B$ with actual rules from B . Here Only unit production is B so We remove it.

Before:

$S \rightarrow ABe \mid Be \mid DAB \mid AB \mid DB \mid B$

$A \rightarrow a$

$B \rightarrow b$

$D \rightarrow d$

After

$S \rightarrow ABe \mid Be \mid DAB \mid AB \mid DB \mid b$

$A \rightarrow a$

$B \rightarrow b$

$D \rightarrow d$

Step 3

Replace Terminals in Long Productions

Introduce new variables for terminals in long RHS.

Before:

$$S \rightarrow ABe \mid Be \mid DAB \mid AB \mid DB \mid b$$
$$A \rightarrow a$$
$$B \rightarrow b$$
$$D \rightarrow d$$

After:

$$S \rightarrow ABY \mid BY \mid DAB \mid AB \mid DB \mid b$$
$$A \rightarrow a$$
$$B \rightarrow b$$
$$D \rightarrow d$$
$$Y \rightarrow e$$

Step 4

Convert to Binary Productions

Break RHS with 3 or more variables into binary productions

Before:

$S \rightarrow ABY \mid BY \mid DAB \mid AB \mid DB \mid b$

$A \rightarrow a$

$B \rightarrow b$

$D \rightarrow d$

$Y \rightarrow e$

After:

$S \rightarrow XY \mid BY \mid DX \mid X \mid DB \mid b$

$X \rightarrow AB$

$Y \rightarrow e$

$A \rightarrow a$

$B \rightarrow b$

$D \rightarrow d$

The background is a light blue gradient, darker at the bottom. It is decorated with several realistic water droplets of various sizes, some with highlights and shadows, located in the top-left, top-right, and bottom-right corners.

Thank you all