TOC - CO2

U. Senthil Kumar
2232003052
Section 3

① Find the left most derivation and Right most derivation for the given grammes.

$S \to 0B \mid 1A$

$A \to 0 \mid 0S \mid 1AA$

$B \to 1 \mid 1S \mid 0BB$ w: 00110101.

Sol:- Given $S \to 0B \mid 1A$

$A \to 0 \mid 0S \mid 1AA$

$B \to 1 \mid 1S \mid 0BB$ w: 00110101

Left derivation

$S \to 0B$
$\to 00BB$
$\to 001SB$
$\to 0011AB$
$\to 00110AB$
$\to 001101B$
$\to 0011010B$
$\to 00110101$

Right most derivation

$S \to 0B$
$\to 00BB$
$\to 00B1$
$\to 001S1$
$\to 0011A1$
$\to 00110S1$
$\to 001101A1$
$\to 00110101$

② Check whether the following grammer is ambiguous or not

$S \to aSb \mid aAb \mid abb$

$A \to aA \mid a$

$B \to Bb \mid b.$

Sol:- $S \to asb \mid aAb \mid aBb.$ lets take a string $w = aabbb$

$A \to aA \mid a$

$B \to Bb \mid b.$

~~Derivation~~ 1 :- $S \rightarrow$ ~~aSB~~ asb
derivation.

$\rightarrow aaSbb$

$\rightarrow aabbb.$

~~A here are no more than~~

A here are no more than derivation for the strings, the grammar is not ambiguous

3) minimise the given CFG.

Sol: $S \rightarrow A|0C1$

$A \rightarrow B|01|10$

$C \rightarrow \in|CD$

Given CFG

$S \rightarrow A|0C1$

$A \rightarrow B|01|10$

$C \rightarrow \in|CA$

minimisation :-

$A \rightarrow B|01|10 \rightarrow$ Eliminates $A \rightarrow B$ as it is a unit production.

$S \rightarrow A|0C1 \rightarrow$ replace A with its production.

$C \rightarrow \in|CD$ eliminate $\in$ production.

minised CFG :-

$S \rightarrow 01|0101|0C1$

$A \rightarrow 01|10.$

$C \rightarrow CD.$