L3.2 – Ambiguous Grammar

A Grammar is said to be Ambiguous if there exists two or more derivation tree for a string w (that means two or more left derivation trees)

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$$5 \rightarrow 5 + 5$$

$$\Rightarrow a + 5$$

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$$5 \rightarrow 5 + 5$$

$$\Rightarrow a + 5 + 5$$

$$\Rightarrow a + 5 + 5$$

$$\Rightarrow a + a + b$$

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$$5 \rightarrow 5 + 5$$

$$\Rightarrow a + 5$$

$$\Rightarrow a + 5 + 5$$

$$\Rightarrow a + a + 5$$

$$\Rightarrow a + a + b$$

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$$5 \rightarrow 5 + 5$$

$$\Rightarrow a + 5$$

$$\Rightarrow a + 5 + 5$$

$$\Rightarrow a + a + b$$

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$$5 \rightarrow 5 + 5$$

$$\Rightarrow a + 5$$

$$\Rightarrow a + 5 + 5$$

$$\Rightarrow a + a + 5$$

$$\Rightarrow a + a + b$$

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$$5 \rightarrow 5 + 5$$

$$\Rightarrow a + 5$$

$$\Rightarrow a + 5 + 5$$

$$\Rightarrow a + a + b$$

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$$5 \rightarrow 5 + 5$$
 $\Rightarrow a + 5$
 $\Rightarrow a + 5 + 5$
 $\Rightarrow a + 5 + 5$
 $\Rightarrow a + 6 + 6$

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$$5 \rightarrow 5 + 5$$

 $\rightarrow a + 5 + 5$
 $\rightarrow a + a + b$

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Example: G = ({S}, {a+b, +, *}, P, S} where P consists of S→ S+S | S*S | a | b
The String a + a * b can be generated as:

$$5 \rightarrow 5 + 5$$
 $\Rightarrow a + 5$
 $\Rightarrow a + 5 + 5$
 $\Rightarrow a + 6 + 5$

Thus, this Grammar is Ambiguous

Questions????