

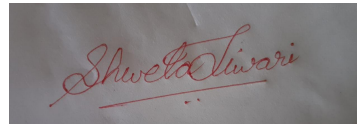
CD: COMPILER DESIGN
CD: UNIT-2 09/2022

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PREPARED FOR
Engineering Students
All Engineering College

CD: COMPILER DESIGN

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TOPIC On: QUESTION ON-

Left Recursion, Left Factoring, FIRST() AND FOLLOW()

1. QUESTION ON- Eliminate Left Recursion

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1. Consider the following grammar and eliminate left recursion-

$$A \rightarrow ABd / Aa / a$$

$$B \rightarrow Be / b$$

2. Consider the following grammar and eliminate left recursion-

$$E \rightarrow E + E / E \times E / a$$

3. Consider the following grammar and eliminate left recursion-

$$E \rightarrow E + T / T$$

$$T \rightarrow T \times F / F$$

$$F \rightarrow id$$

4. Consider the following grammar and eliminate left recursion-

$$S \rightarrow (L) / a$$

$$L \rightarrow L, S / S$$

5. Consider the following grammar and eliminate left recursion-

$$S \rightarrow S0S1S / 01$$

6. Consider the following grammar and eliminate left recursion-

$$S \rightarrow A$$

$$A \rightarrow Ad / Ae / aB / ac$$

$$B \rightarrow bBc / f$$

7. Consider the following grammar and eliminate left recursion-

$$A \rightarrow AA\alpha / \beta$$

8. Consider the following grammar and eliminate left recursion-

$$A \rightarrow Ba / Aa / c$$

$$B \rightarrow Bb / Ab / d$$

9. Consider the following grammar and eliminate left recursion-

$$X \rightarrow XSb / Sa / b$$

$$S \rightarrow Sb / Xa / a$$

10. Consider the following grammar and eliminate left recursion-

$$S \rightarrow Aa / b$$

$$A \rightarrow Ac / Sd / \epsilon$$

2. QUESTION ON- Eliminate Left Factoring

1. Do left factoring in the following grammar-

$$S \rightarrow iEtS / iEtSeS / a$$

$$E \rightarrow b$$

2. Do left factoring in the following grammar-

3. $A \rightarrow aAB / aBc / aAc$

3. Do left factoring in the following grammar-

$$S \rightarrow bSSaaS / bSSaSb / bSb / a$$

4. Do left factoring in the following grammar-

5. $S \rightarrow aSSbS / aSaSb / abb / b$

5. Do left factoring in the following grammar-

$$S \rightarrow a / ab / abc / abcd$$

6. Do left factoring in the following grammar-

$$S \rightarrow aAd / aB$$

$$A \rightarrow a / ab$$

$$B \rightarrow ccd / ddc$$

3. QUESTION ON- Find FIRST() And FOLLOW()

1. Calculate the first and follow functions for the given grammar-

$$S \rightarrow aBDh$$

$$B \rightarrow cC$$

$$C \rightarrow bC / \epsilon$$

$$D \rightarrow EF$$

$$E \rightarrow g / \epsilon$$

$$F \rightarrow f / \epsilon$$

2. Calculate the first and follow functions for the given grammar-

$$S \rightarrow A$$

$$A \rightarrow aB / Ad$$

$$B \rightarrow b$$

$$C \rightarrow g$$

3. Calculate the first and follow functions for the given grammar-

$$S \rightarrow (L) / a$$

$$L \rightarrow SL'$$

$$L' \rightarrow ,SL' / \epsilon$$

4. Calculate the first and follow functions for the given grammar-

$$S \rightarrow AaAb / BbBa$$

$$A \rightarrow \epsilon$$

$$B \rightarrow \epsilon$$

5. Calculate the first and follow functions for the given grammar-

$$E \rightarrow E + T / T$$

$$T \rightarrow T \times F / F$$

$$F \rightarrow (E) / \text{id}$$

6. Calculate the first and follow functions for the given grammar-

$$S \rightarrow ACB / CbB / Ba$$

$$A \rightarrow da / BC$$

$$B \rightarrow g / \in$$

$$C \rightarrow h / \in$$