

Variant 8.

$V_n = \{S, A, B, C, D\}$

$V_t = \{a, b, c, d, e\}$

$P = \{S \rightarrow LdX$

$X \rightarrow D$

$L \rightarrow ca$

$L \rightarrow aL$

$D \rightarrow b$

$D \rightarrow Deb\}$

word: aaaacadeebbb

1. Elimination of left recursion and left factoring

$D \rightarrow Deb$

$\alpha_1 = eb$

$D \rightarrow b$

$\beta_1 = b$

$D \rightarrow bY$

$Y \rightarrow ebY$

$Y \rightarrow \epsilon$

$P = \{S \rightarrow LdX$

$X \rightarrow D$

$L \rightarrow ca$

$L \rightarrow aL$

$D \rightarrow b$

$D \rightarrow bY$

$Y \rightarrow ebY$

$Y \rightarrow \epsilon\}$

$D \rightarrow bE$

$E \rightarrow Y \mid \epsilon$

$P = \{S \rightarrow LdX$

$X \rightarrow D$

$L \rightarrow ca \mid aL$

$D \rightarrow bE$

$E \rightarrow Y \mid \epsilon$

$Y \rightarrow ebY \mid \epsilon\}$

2. First Follow Matrix

| | First | Follow |
|---|--------------|---------------|
| S | c, a | \$ |
| X | b | \$ |
| L | c, a | d |
| D | b | \$ |
| E | e, empty | \$ |
| Y | e, empty | \$ |

FOLLOW(S) = {\$}

FOLLOW(S) includes in FOLLOW(X) = {\$}

FOLLOW(X) includes in FOLLOW(D) = {\$}

FOLLOW(D) includes in FOLLOW(E) = {\$}

FOLLOW(E) includes in FOLLOW(Y) = {\$}

FOLLOW(Y) includes in FOLLOW(Y) = {\$}

FOLLOW(L) = {d}

FOLLOW(L) includes in FOLLOW(L) = {d}

3. Predictive Matrix

| | a | b | c | d | e | \$ |
|---|-----|----|-----|---|-----|-----|
| S | LdX | - | LdX | - | - | - |
| X | - | D | - | - | - | - |
| L | aL | - | ca | - | - | - |
| D | - | bE | - | - | - | - |
| E | - | - | - | - | Y | eps |
| Y | - | - | - | - | ebY | - |

4. Input Parsing Table

String «aaaacadeebbb»

| Stack | Input | Action |
|--------------|----------------|---------------|
| S\$ | aaaacadeebbb\$ | LdX |
| LdX\$ | aaaacadeebbb\$ | aL |
| aLdX\$ | aaaacadeebbb\$ | terminal |
| LdX\$ | aaacadeebbb\$ | aL |
| aLdX\$ | aaacadeebbb\$ | terminal |
| LdX\$ | aacadeebbb\$ | aL |
| aLdX\$ | aacadeebbb\$ | terminal |
| LdX\$ | acadeebbb\$ | aL |
| aLdX\$ | acadeebbb\$ | terminal |
| LdX\$ | cadeebbb\$ | ca |
| cadX\$ | cadeebbb\$ | terminal |
| X\$ | eebbb\$ | rejected |

String «aaaacadeebbb» is rejected.

Let's try to check the word «aaaacadb»

| Stack | Input | Action |
|--------|------------|----------|
| S\$ | aaaacadb\$ | LdX |
| LdX\$ | aaaacadb\$ | aL |
| aLdX\$ | aaaacadb\$ | terminal |
| LdX\$ | aaacadb\$ | aL |
| aLdX\$ | aaacadb\$ | terminal |
| LdX\$ | aacadb\$ | aL |
| aLdX\$ | aacadb\$ | terminal |
| LdX\$ | acadb\$ | aL |
| aLdX\$ | acadb\$ | terminal |
| LdX\$ | cadb\$ | ca |
| cadX\$ | cadb\$ | terminal |
| dX\$ | db\$ | terminal |
| X\$ | b\$ | D |
| D\$ | b\$ | bE |
| bE\$ | b\$ | terminal |
| E\$ | \$ | eps |
| \$ | \$ | done |

String «aaaacadb» is accepted!