

Úlohy na cvičenie: Určte, či sú gramatiky $SLR(1)$ alebo nie.

Gramatika:

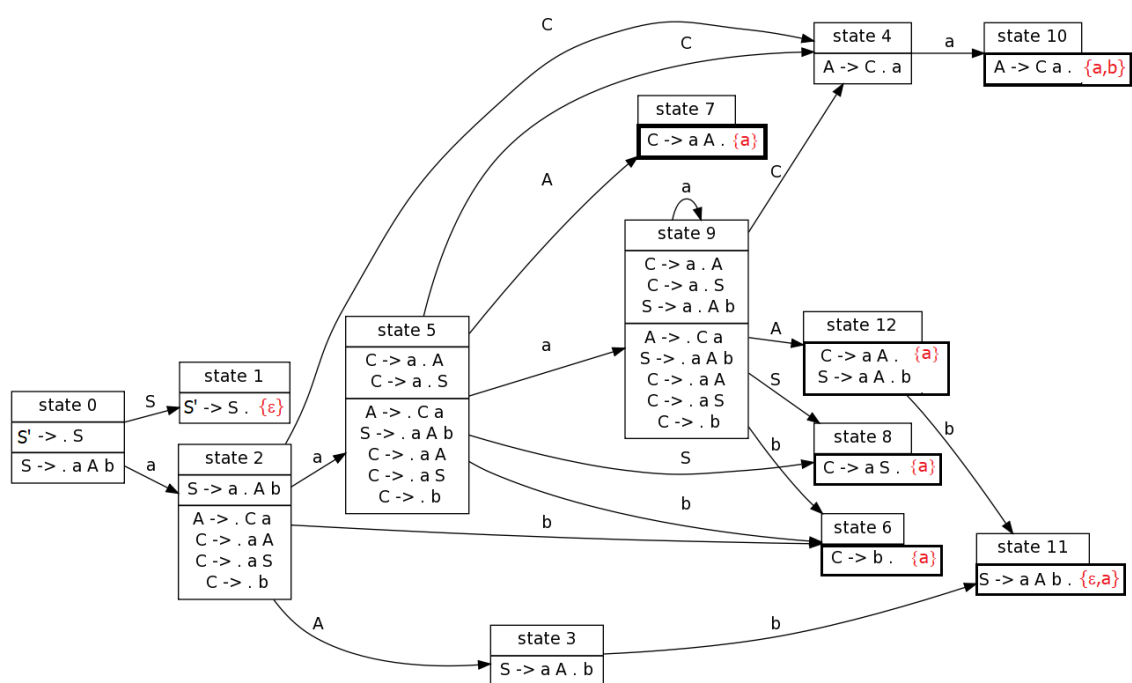
$$S \rightarrow Ab$$

$$A \rightarrow c \mid Sb$$

Riešenie:

Táto gramatika je $SLR(1)$: Množina $FOLLOW$ neterminálov:

| | | | |
|----------|----------------|-------------------|---------|
| | S' | S | A |
| $FOLLOW$ | $\{\epsilon\}$ | $\{\epsilon, b\}$ | $\{b\}$ |



| ACTION | s0 | s1 | s2 | s3 | s4 | s5 | s6 | s7 | s8 | s9 | s10 | s11 | s12 |
|------------|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|
| a | P | | P | | P | P | R5 | R3 | R4 | P | R2 | R1 | R3 |
| b | | | P | P | | P | | | | P | R2 | | P |
| ϵ | | A | | | | | | | | | | R1 | |

| GOTO | s0 | s1 | s2 | s3 | s4 | s5 | s6 | s7 | s8 | s9 | s10 | s11 | s12 |
|------|----|----|----|-----|-----|----|----|----|----|-----|-----|-----|-----|
| a | s2 | | s5 | | s10 | s9 | | | | s9 | | | |
| b | | | s6 | s11 | | s6 | | | | s6 | | | s11 |
| S | s1 | | | | | s8 | | | | s8 | | | |
| A | | | s3 | | | s7 | | | | s12 | | | |
| C | | | s4 | | | s4 | | | | s4 | | | |

Gramatika:

$$S \rightarrow aAb$$

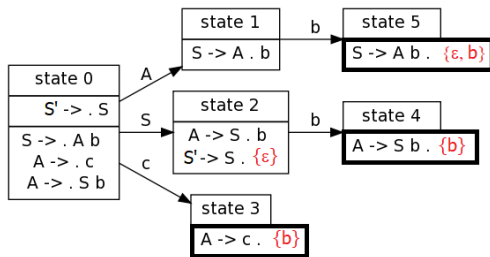
$$A \rightarrow Ca$$

$$C \rightarrow aA \mid aS \mid b$$

Riešenie:

Táto gramatika je *SLR(1)* : Množina *FOLLOW* neterminálov:

| | S' | S | A | C |
|---------------|-------------------|----------------------|------------|---------|
| <i>FOLLOW</i> | $\{\varepsilon\}$ | $\{\varepsilon, a\}$ | $\{a, b\}$ | $\{a\}$ |



| | | | | | | |
|---------------|----|----|----|----|----|----|
| ACTION | s0 | s1 | s2 | s3 | s4 | s5 |
| b | | P | P | R2 | R3 | R1 |
| c | P | | | | | |
| ε | | | A | | | R1 |
| | | | | | | |
| GOTO | s0 | s1 | s2 | s3 | s4 | s5 |
| b | | s5 | s4 | | | |
| c | s3 | | | | | |
| S | s2 | | | | | |
| A | s1 | | | | | |

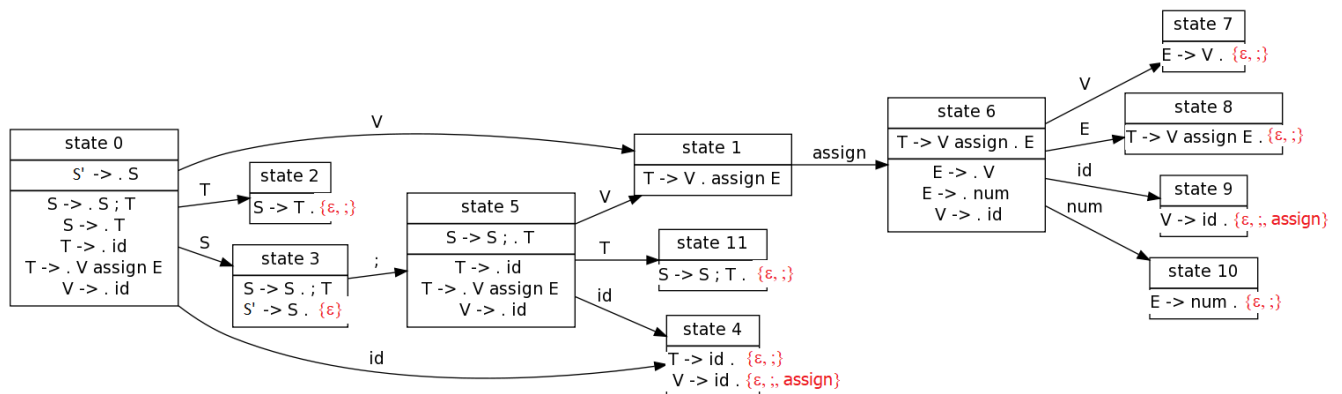
Gramatika:

1. $S \rightarrow S ; T$
2. $S \rightarrow T$
3. $T \rightarrow id$
4. $T \rightarrow V \text{ assign } E$
5. $V \rightarrow id$
6. $E \rightarrow V$
7. $E \rightarrow num$

Riešenie: Množina FOLLOW neterminálov:

| | S | T | E | V |
|--------|------------------|------------------|------------------|---------------------------|
| FOLLOW | {;, ϵ } | {;, ϵ } | {;, ϵ } | {;, ϵ , assign } |

Nejde o $SLR(1)$ gramatiku, pretože obsahuje konflikt Redukcia-redukcia (v tabuľke ACTION označený červenou farbou). Príslušný automat a tabuľka ACTION (GOTO je vidieť aj z prechodového diagramu automatu).



| ACTION | s0 | s1 | s2 | s3 | s4 | s5 | s6 | s7 | s8 | s9 | s10 |
|------------|----|----|----|----|-------|----|----|----|----|----|-----|
| ; | | | R2 | P | R3/R5 | | | R6 | R4 | R5 | R7 |
| assign | | P | | | R5 | | | | | R5 | |
| id | P | | | | | P | P | | | | |
| num | | | | | | | P | | | | |
| ϵ | | | R2 | A | R3/R5 | | | R6 | R4 | R5 | R7 |

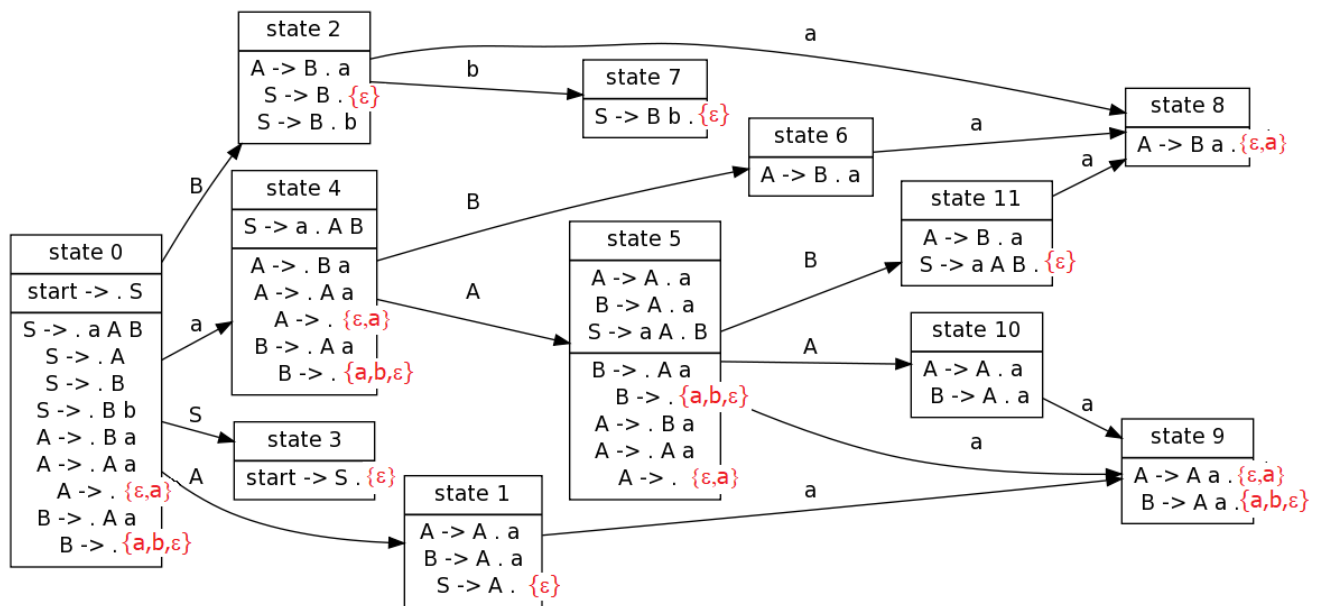
Nasledovná gramatika:

1. $S \rightarrow aAB$
2. $S \rightarrow A$
3. $S \rightarrow B$
4. $S \rightarrow Bb$
5. $A \rightarrow Ba$
6. $A \rightarrow Aa$
7. $A \rightarrow \varepsilon$
8. $B \rightarrow Aa$
9. $B \rightarrow \varepsilon$

Riešenie: Množina FOLLOW neterminálov:

| | | | |
|----------|-------------------|----------------------|-------------------------|
| | S | A | B |
| $FOLLOW$ | $\{\varepsilon\}$ | $\{a, \varepsilon\}$ | $\{a, b, \varepsilon\}$ |

Gramatika nie je $SLR(1)$, pretože obsahuje aj konflikty Presun-Redukcia, aj konflikty Redukcia-Redukcia, dokonca v stavoch s_0 a s_5 aj situáciu, že je tam pre ten istý vstup aj konflikt P-R, aj konflikt R-R.



| ACTION | s0 | s1 | s2 | s3 | s4 | s5 | s6 | s7 | s8 | s9 | s10 | s11 |
|---------------|---------|----|----|----|-------|---------|----|----|----|-------|-----|-----|
| a | P/R7/R9 | P | P | | R7/R9 | P/R7/R9 | P | | R5 | R6/R8 | P | P |
| b | R9 | | P | | R9 | R9 | | | | R8 | | |
| ε | R7/R9 | R2 | R3 | A | R7/R9 | R7/R9 | | R4 | R5 | R6/R8 | | R1 |