

Vypracoval: James Bond

UČO: 007

Skupina: MI6

2. [2 body] Uvažme bezkontextovou gramatiku $\mathcal{G} = (\{S, \acute{A}, B\}, \{a, l, n, \acute{y}, z\}, P, S)$, kde

$$\begin{aligned} P = \{ & S \rightarrow aSa \mid nSl \mid \acute{A}B, \\ & \acute{A} \rightarrow aS \mid \acute{A}a \mid z \mid \epsilon, \\ & B \rightarrow lB \mid \acute{y}\acute{A} \mid \epsilon\}. \end{aligned}$$

Sestrojte analyzátor *zdola nahoru* a analyzujte slovo „analýza“.

Řešení

Analyzátor *zdola nahoru* pro jazyk $L(\mathcal{G})$ sestrojený podle algoritmu je zásobníkový automat $\mathcal{M} = (\{q, r\}, \Sigma = \{a, l, n, \acute{y}, z\}, \{S, \acute{A}, B, \perp, a, l, n, \acute{y}, z\}, \delta, q, \perp, \{r\})$, kde

$$\begin{aligned} \delta(q, \epsilon, aSa) &= \{(q, S)\}, \\ \delta(q, \epsilon, nSl) &= \{(q, S)\}, \\ \delta(q, \epsilon, \acute{A}B) &= \{(q, S)\}, \\ \delta(q, \epsilon, aS) &= \{(q, \acute{A})\} \\ \delta(q, \epsilon, \acute{A}a) &= \{(q, \acute{A})\}, \\ \delta(q, \epsilon, z) &= \{(q, \acute{A})\}, \\ \delta(q, \epsilon, \epsilon) &= \{(q, \acute{A}), (q, B)\}, \\ \delta(q, \epsilon, lB) &= \{(q, B)\}, \\ \delta(q, \epsilon, \acute{y}\acute{A}) &= \{(q, B)\}, \\ \forall x \in \Sigma \quad \delta(q, x, \epsilon) &= \{(q, x)\}, \\ \delta(q, \epsilon, \perp S) &= \{(r, \epsilon)\}. \end{aligned}$$

Automat akceptuje koncovým stavem.

Analýza slova „analýza“:

$$\begin{aligned} (q, \text{analýza}, \perp) &\stackrel{a}{\vdash} (q, \text{nalýza}, \perp a) \stackrel{n}{\vdash} (q, \text{alýza}, \perp an) \stackrel{\epsilon}{\vdash} (q, \text{alýza}, \perp an\acute{A}) \\ &\stackrel{a}{\vdash} (q, \text{lýza}, \perp an\acute{A}a) \stackrel{\epsilon}{\vdash} (q, \text{lýza}, \perp an\acute{A}) \stackrel{\epsilon}{\vdash} (q, \text{lýza}, \perp an\acute{A}B) \\ &\stackrel{\epsilon}{\vdash} (q, \text{lýza}, \perp anS) \stackrel{l}{\vdash} (q, \acute{y}za, \perp anSl) \stackrel{\epsilon}{\vdash} (q, \acute{y}za, \perp aS) \\ &\stackrel{\epsilon}{\vdash} (q, \acute{y}za, \perp \acute{A}) \stackrel{\acute{y}}{\vdash} (q, za, \perp \acute{A}\acute{y}) \stackrel{z}{\vdash} (q, a, \perp \acute{A}\acute{y}z) \stackrel{\epsilon}{\vdash} (q, a, \perp \acute{A}\acute{y}\acute{A}) \\ &\stackrel{a}{\vdash} (q, \epsilon, \perp \acute{A}\acute{y}\acute{A}a) \stackrel{\epsilon}{\vdash} (q, \epsilon, \perp \acute{A}\acute{y}\acute{A}) \stackrel{\epsilon}{\vdash} (q, \epsilon, \perp \acute{A}B) \stackrel{\epsilon}{\vdash} (q, \epsilon, \perp S) \stackrel{\epsilon}{\vdash} (r, \epsilon, \epsilon) \end{aligned}$$