Факторизованная грамматика для интерпретатора лямбда-выражений

1 Грамматика

Терминальные символы $\Sigma = \{\backslash, .\ , (\ ,)\ , [\text{a-zA-Z}], [\text{0-9}],\ \_\ , \text{let}\ , =\ , \backslash\text{n}\}$

Нетерминальные символы N = {program, definition, term, term', lambda-abstraction, variable, letter, digit }

Стартовый символ S = {programm}

1.1 Правила

$\langle program\rangle ::= \langle definition\rangle\{\backslash n\langle program\rangle\} \mid \langle term\rangle\{\backslash n\langle program\rangle\}$
$\langle definition\rangle ::= let\ \langle variable\rangle = \langle term\rangle$
$\langle term\rangle ::= \langle term'\rangle[\backslash s]\langle term\rangle \mid \langle term'\rangle$
$\langle term'\rangle ::= \langle lambda - abstraction\rangle \mid \langle variable\rangle \mid (\langle term\rangle)$
$\langle lambda - abstraction\rangle ::= \backslash\langle variable\rangle\{\ \langle variable\rangle\}.\langle term\rangle$
$\langle variable\rangle ::= \langle letter\rangle\{\langle letter\rangle\langle digit\rangle\}$
$\langle letter\rangle ::= a|...|z|A|...|Z$
$\langle digit\rangle ::= 0|1|2|3|4|5|6|7|8|9$

2 Примеры

let S = \x y z.x z (y z)
let K = \x y.x
Вывод: Для K
$\langle program\rangle \to \langle definition\rangle \to let\ \langle variable\rangle = \langle term\rangle \to let\ K = \langle term\rangle \to$
$let\ K = \langle lambda - abstraction\rangle \to let\ K = \backslash\langle variable\rangle\{\ \langle variable\rangle\}.\langle term\rangle \to$
$let\ K = \backslash x\ y.\langle term\rangle \to let\ K = \backslash x\ y.\langle variable\rangle \to let\ K = \backslash x\ y.x$
S
$\langle program\rangle \to \langle definition\rangle \to let\ \langle variable\rangle = \langle term\rangle \to let\ S = \langle term\rangle \to$
$let\ S = \langle lambda - abstraction\rangle \to let\ S = \backslash\langle variable\rangle\{\ \langle variable\rangle\}.\langle term\rangle \to$
$let\ S = \backslash x\ y\ z.\langle term\rangle \to let\ S = \backslash x\ y\ z.\langle term'\rangle\ \langle term\rangle \to let\ S = \backslash x\ y\ z.\langle variable\rangle\ \langle term\rangle \to$
$let\ S = \backslash x\ y\ z.x\ \langle term\rangle \to let\ S = \backslash x\ y\ z.x\ \langle term'\rangle\ \langle term\rangle \to let\ S = \backslash x\ y\ z.x\ \langle variable\rangle\ \langle term\rangle \to$

$let\ S = \backslash x\ y\ z.x\ z\ \langle term \rangle \rightarrow let\ S = \backslash x\ y\ z.x\ z\ \langle term' \rangle \rightarrow let\ S = \backslash x\ y\ z.x\ z\ (\langle term \rangle) \rightarrow$
$let\ S = \backslash x\ y\ z.x\ z\ (\langle term' \rangle\ \langle term \rangle) \rightarrow let\ S = \backslash x\ y\ z.x\ z\ (\langle variable \rangle\ \langle term \rangle) \rightarrow$
$let\ S\ =\ \backslash x\ y\ z.x\ z\ (y\ \langle term \rangle)\ \rightarrow\ let\ S\ =\ \backslash x\ y\ z.x\ z\ (y\ \langle term' \rangle)\ \rightarrow\ let\ S\ =$
$\backslash x\ y\ z.x\ z\ (y\ \langle variable \rangle) \rightarrow let\ S = \backslash x\ y\ z.x\ z\ (y\ z)$