Lambda Grammar

Ksenchik Nikita

May 28, 2023

1 Grammar

$< program > ::= \ let < variable > = < term > \ | \ < term >$
$< term > ::= < application > \ | \ < term' >$
$< term' > ::= < variable > \ | \ < abstraction > \ | \text{"("} < term > \text{")"}$
$< applique > ::= < term' > < term' > \ \{< term' >\}$
$< abstraction > ::= \ \backslash < variable > \ \{< variable >\}. < term >$
$< variable > ::= < keyword - excepion > | \ < letter > \ \{< letter > \ | \ < digit >\}$
$< keyword - exception > ::= \ let$
$< letter > ::= \ a \mid ... \mid z \mid A \mid ... \mid Z$
$< digit > ::= \ 1 \mid ... \mid 9$

2 Examlpe 1

$letK = \backslash x \ y.x \implies$
$< program >$
$let \ < variable > = < term >$
$let \ < letter > \ \{< letter > \ | \ < digit >\} \ = < term >$
$let \ K \ \{< letter > \ | \ < digit >\} \ = < term >$
$let \ K \ = < term >$
$let \ K \ = < term' >$
$let \ K \ = < abstraction >$
$let \ K \ = \ \backslash < variable > \ \{< variable >\}. < term >$
$let \ K \ = \ \backslash < letter > \ \{< letter > \ | \ < digit >\} \ \{< variable >\}. < term >$
$let \ K \ = \ \backslash < letter > \ \{< variable >\}. < term >$
$let \ K \ = \ \backslash x \ \{< variable >\}. < term >$
$let \ K \ = \ \backslash x \ < variable > \ \{< variable >\}. < term >$
$let \ K \ = \ \backslash x \ < letter > \ \{< letter > \ | \ < digit >\} \ \{< variable >\}. < term >$
$let \ K \ = \ \backslash x \ y \ \{< letter > \ | \ < digit >\} \ \{< variable >\}. < term >$
$let \ K \ = \ \backslash x \ y \ \{< variable >\}. < term >$
$let \ K \ = \ \backslash x \ y. < term >$
$let \ K \ = \ \backslash x \ y. < term' >$
$let \ K \ = \ \backslash x \ y. < variable >$
$let \ K \ = \ \backslash x \ y. < letter > \ \{< letter > \ | \ < digit >\}$
$let \ K \ = \ \backslash x \ y.x \ \{< letter > \ | \ < digit >\}$
$let \ K \ = \ \backslash x \ y.x$

3 Example 2

$let \ gg \ = \ (\backslash l \ o.l) \ e \ z \implies$
$< program >$
$let \ < letter > \ \{< letter > \ | \ < digit >\} \ = < term >$
$let \ g \ \{< letter > \ | \ < digit >\} \ = < term >$

$let\ g\ <letter>\ \{<letter>\ |\ <digit>\}\ =<term>$
$let\ gg\ \{<letter>\ |\ <digit>\}\ =<term>$
$let\ gg\ =<term>$
$let\ gg\ =<applique>$
$let\ gg\ =<term'><term'>\ \{<term'>\}$
$let\ gg\ =\ (<term>)\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (<term'>)\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (<abstraction>)\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash <variable>\ \{<variable>\}.<term>)\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash <letter>\ \{<letter>\ |\ <digit>\}\ \{<variable>\}.<term>)\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ \{<letter>\ |\ <digit>\}\ \{<variable>\}.<term>)\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ \{<variable>\}.<term>)\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ <variable>\ \{<variable>\}.<term>)\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ <letter>\ \{<letter>\ |\ <variable>\}\ \{<variable>\}.<term>)\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o\ \{<letter>\ |\ <variable>\}\ \{<variable>\}.<term>)\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o\ \{<variable>\}.<term>)\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.<term>)\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.<term'>)\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.<variable>)\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.<letter>\ \{<letter>\ |\ <digit>\})\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.l\ \{<letter>\ |\ <digit>\})\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.l)\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.l)\ <variable>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.l)\ <letter>\ \{<letter>\ |\ <digit>\}\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.l)\ e\ \{<letter>\ |\ <digit>\}\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.l)\ e\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.l)\ e\ <term'>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.l)\ e\ <variable>\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.l)\ e\ <letter>\ \{<letter\ |\ <digit>\}\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.l)\ e\ z\ \{<letter\ |\ <digit>\}\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.l)\ e\ z\ \{<term'>\}$
$let\ gg\ =\ (\backslash l\ o.l)\ e\ z$