

Project 2

Tuesday, March 14, 2017 5:11 PM

Program \rightarrow Type

First 13 Grammars

① Program: (P)
 $P \rightarrow p i s C$
 $P \rightarrow p C$

$P = \text{Program}$ $i = \text{ID}$ $C = \text{Class Decl.}$
 $p = \text{Pnum}$ $s = \text{semi}$

② Class Decl (C)
 $C \rightarrow c i B$

$c = \text{class num}$ $B = \text{class Body}$

③ Class Body (B)
 $B \rightarrow \{ D X \}$
 $B \rightarrow \{ X \}$
 $B \rightarrow \{ D \}$
 $X \rightarrow M$
 $X \rightarrow X M$

$D = \text{Decls}$
 $M = \text{Method Decl}$

④ Decls (D)
 $D \rightarrow d e$
 $D \rightarrow d X e$
 $X \rightarrow F$
 $X \rightarrow X F$

$d = \text{Declarations num}$
 $e = \text{End declarations num}$
 $F = \text{Field Decl}$

⑤ Field Decl (F)
 $F \rightarrow T X$
 $X \rightarrow V Y$
 $Y \rightarrow ; X$
 $Y \rightarrow ;$

$T = \text{Type}$
 $V = \text{Variable Decl Id}$
 $W = \text{Variable Initializer}$

$$\begin{aligned}
 Y &\rightarrow = E \\
 Z &\rightarrow W, X \\
 Z &\rightarrow W;
 \end{aligned}$$

⑥ Variable Decl Id (V) $i = id$

$$\begin{aligned}
 V &\rightarrow i X \\
 V &\rightarrow i \\
 X &\rightarrow [] \\
 X &\rightarrow [] X
 \end{aligned}$$

⑦ Variable Initializer (W)

$$\begin{aligned}
 W &\rightarrow E & E &= \text{Expression} \\
 W &\rightarrow A & A &= \text{Array Initializer} \\
 W &\rightarrow C & C &= \text{Array Creation Expression}
 \end{aligned}$$

⑧ Array Initializer (A)

$$\begin{aligned}
 A &\rightarrow \{ V \} \\
 A &\rightarrow \{ V, X \} \\
 X &\rightarrow , V \\
 X &\rightarrow , V X
 \end{aligned}$$

⑨ Array Creation Expression (C)

$$\begin{aligned}
 C &\rightarrow i X & E &= \text{Expression} \\
 X &\rightarrow [E] & i &= \text{int}_{num} \\
 X &\rightarrow [E] X
 \end{aligned}$$

⑩ Method Decl (M)

$$M \rightarrow m X i () B$$

$m = \text{method name}$
 $i = \text{identifier name}$

$M \rightarrow mXi(F)B$
 $X \rightarrow T$
 $X \rightarrow V$

$F = \text{Formal Parameter List}$
 $B = \text{Block}$
 $V = \text{Void num}$
 $T = \text{type}$

⑪ Formal Parameter List (F)

$F \rightarrow vid$
 $F \rightarrow vidX$
 $F \rightarrow id$
 $F \rightarrow idX$
 $X \rightarrow id$
 $X \rightarrow idX$
 $X \rightarrow ; F$

$i = \text{int}$
 $d = \text{identifier}$
 $v = \text{val}$

⑫ Block (B)

$B \rightarrow DS$
 $B \rightarrow S$

$D = \text{Decls}$
 $S = \text{Statement List}$

⑬ Type (T)

$T \rightarrow XY$
 $T \rightarrow X$
 $Y \rightarrow []$
 $Y \rightarrow [] Y$
 $Y \rightarrow [] . T$
 $X \rightarrow d$
 $X \rightarrow i$

$i = \text{int}$
 $d = \text{identifier}$