Jani Viherväs
jani.vihervas@cs.helsinki.fi

Mini-Java Compiler

582648 Code Generation

http://www.cs.helsinki.fi/u/vihavain/k12/compiler_project/project/compiler_project_2012.html

1 Overview

2 Grammar

$$
\begin{aligned}
< program > \;\;&\to\;\; < main\ class >< class\ declaration > * \\
< main\ class > \;\;&\to\;\; \textbf{class} < identifier > \{\textbf{public static void main() } \{ < statement > *\}\} \\
< class\ declaration > \;\;&\to\;\; \textbf{class} < identifier > [\textbf{extends} < identifier >]\{ < declaration > *\} \\
< declaration > \;\;&\to\;\; < variable\ declaration > | < method\ declaration >
\end{aligned}
$$

$$
\begin{aligned}
< method\ declaration > \;\;&\to\;\; \textbf{public} < type >< identifier > ([< formals >]) \ \{ < statement > *\} \\
< variable\ declaration > \;\;&\to\;\; < type >< identifier >< variable\ assignment > ; \\
< variable\ assignment > \;\;&\to\;\; \epsilon \,|< expr > \\
< formals > \;\;&\to\;\; < type >< identifier > (, < type >< identifier >)* \\
< type > \;\;&\to\;\; < simple\ type >|< array\ type > \\
< simple\ type > \;\;&\to\;\; \textbf{int} \,|\, \textbf{boolean} \,|\, \textbf{void} \,|< type\ identifier > \\
< array\ type > \;\;&\to\;\; < simple\ type > [\,] \\
< type\ identifier > \;\;&\to\;\; < identifier >
\end{aligned}
$$

$$
\begin{aligned}
< statement > \;\;&\to\;\; \textbf{assert } (< expr >) \\
&\;|\;\; < variable\ declaration > \\
&\;|\;\; \{<\textbf{statement}>* \ \} \\
&\;|\;\; \textbf{if } (< expr >) < statement >< else > \\
&\;|\;\; \textbf{while } (< expr >) < statement > \\
&\;|\;\; \textbf{System.out.println } (< expr >); \\
&\;|\;\; < identifier > = < expr > ; \\
&\;|\;\; \textbf{return} < expr > ; \\
&\;|\;\; < method\ invocation > ; \\
< else > \;\;&\to\;\; \epsilon \,|\, \textbf{else} < statement > \\
< method\ invocation > \;\;&\to\;\; < expr > . < identifier > ([< expr > (, < expr >)*])
\end{aligned}
$$

$$
\begin{aligned}
< expr > \;\;&\to\;\; < expr1 >< expr2 > \\
< expr1 > \;\;&\to\;\; \textbf{new} < new > \\
&\;|\;\; ! < expr > \\
&\;|\;\; (< expr >) \\
&\;|\;\; < identifier >|< integer\ literal > \\
&\;|\;\; \textbf{this} \,|\, \textbf{true} \,|\, \textbf{false} \\
&\;|\;\; < method\ invocation > \\
< expr2 > \;\;&\to\;\; \epsilon \,|\, [< expr >]\,|\,\textbf{.length} \\
&\;|\;\; < binary\ operator >< expr > \\
< new > \;\;&\to\;\; < simple\ type > \{ < expr > \} \,|< type\ identifier > (\,) \\
< binary\ operator > \;\;&\to\;\; \&\&\,|\,||\,|<|>|==|+|-|*|/|\%
\end{aligned}
$$