$$
\begin{aligned}
\textit{program} \quad &\rightarrow \quad \textit{block} \\
\textit{block} \quad &\rightarrow \quad \{ \ \textit{decls stmts} \ \} \\
\textit{decls} \quad &\rightarrow \quad \textit{decls decl} \ | \ \epsilon \\
\textit{decl} \quad &\rightarrow \quad \textit{type } \textbf{id} \ ; \\
\textit{type} \quad &\rightarrow \quad \textit{type } [\ \textbf{num} \ ] \ | \ \textbf{basic} \\
\textit{stmts} \quad &\rightarrow \quad \textit{stmts stmt} \ | \ \epsilon
\end{aligned}
$$

$$
\begin{aligned}
\textit{stmt} \quad &\rightarrow \quad \textit{loc} = \textit{bool} \ ; \\
&\ \ | \quad \textbf{if} \ (\ \textit{bool} \ ) \ \textit{stmt} \\
&\ \ | \quad \textbf{if} \ (\ \textit{bool} \ ) \ \textit{stmt} \ \textbf{else} \ \textit{stmt} \\
&\ \ | \quad \textbf{while} \ (\ \textit{bool} \ ) \ \textit{stmt} \\
&\ \ | \quad \textbf{do} \ \textit{stmt} \ \textbf{while} \ (\ \textit{bool} \ ) \ ; \\
&\ \ | \quad \textbf{break} \ ; \\
&\ \ | \quad \textit{block} \\
\textit{loc} \quad &\rightarrow \quad \textit{loc} \ [\ \textit{bool} \ ] \ | \ \textbf{id} \\
\textit{bool} \quad &\rightarrow \quad \textit{bool} \ || \ \textit{join} \ | \ \textit{join} \\
\textit{join} \quad &\rightarrow \quad \textit{join} \ \&\& \ \textit{equality} \ | \ \textit{equality} \\
\textit{equality} \quad &\rightarrow \quad \textit{equality} \ == \ \textit{rel} \ | \ \textit{equality} \ != \ \textit{rel} \ | \ \textit{rel} \\
\textit{rel} \quad &\rightarrow \quad \textit{expr} < \textit{expr} \ | \ \textit{expr} <= \textit{expr} \ | \ \textit{expr} >= \textit{expr} \ | \\
&\qquad \textit{expr} > \textit{expr} \ | \ \textit{expr} \\
\textit{expr} \quad &\rightarrow \quad \textit{expr} + \textit{term} \ | \ \textit{expr} - \textit{term} \ | \ \textit{term} \\
\textit{term} \quad &\rightarrow \quad \textit{term} * \textit{unary} \ | \ \textit{term} \ / \ \textit{unary} \ | \ \textit{unary} \\
\textit{unary} \quad &\rightarrow \quad ! \ \textit{unary} \ | \ - \ \textit{unary} \ | \ \textit{factor} \\
\textit{factor} \quad &\rightarrow \quad (\ \textit{bool} \ ) \ | \ \textit{loc} \ | \ \textbf{num} \ | \ \textbf{real} \ | \ \textbf{true} \ | \ \textbf{false}
\end{aligned}
$$