EBNF Grammar for Jay Syntax

$$
\begin{array}{rcl}
\mathit{Program} & \rightarrow & \text{void main ( )} \; '\{' \; \mathit{Declarations} \; \mathit{Statements} \; '\}' \\
\mathit{Declarations} & \rightarrow & \{ \; \mathit{Declaration} \; \}^* \\
\mathit{Declaration} & \rightarrow & \mathit{Type} \; \mathit{Identifiers}; \\
\mathit{Type} & \rightarrow & \text{int} \mid \text{boolean} \\
\mathit{Identifiers} & \rightarrow & \mathit{Identifier} \; \{ \; , \; \mathit{Identifier} \; \}^* \\
\mathit{Statements} & \rightarrow & \{ \; \mathit{Statement} \; \}^* \\
\mathit{Statement} & \rightarrow & ; \mid \mathit{Block} \mid \mathit{Assignment} \mid \mathit{IfStatement} \mid \mathit{WhileStatement} \\
\mathit{Block} & \rightarrow & '\{' \; \mathit{Statements} \; '\}' \\
\mathit{Assignment} & \rightarrow & \mathit{Identifier} \; = \; \mathit{Expression} \; ; \\
\mathit{IfStatement} & \rightarrow & \text{if} \; (\; \mathit{Expression} \;) \; \mathit{Statement} \; \{ \; \text{else} \; \mathit{Statement} \; \}_{opt} \\
\mathit{WhileStatement} & \rightarrow & \text{while} \; (\; \mathit{Expression} \;) \; \mathit{Statement} \\
\mathit{Expression} & \rightarrow & \mathit{Conjunction} \; \{ \; || \; \mathit{Conjunction} \; \}^* \\
\mathit{Conjunction} & \rightarrow & \mathit{Relation} \; \{ \; \&\& \; \mathit{Relation} \; \}^* \\
\mathit{Relation} & \rightarrow & \mathit{Addition} \; \{ \; [\; < \mid <= \mid > \mid >= \mid == \mid != \;] \; \mathit{Addition} \; \}^* \\
\mathit{Addition} & \rightarrow & \mathit{Term} \; \{ \; [\; + \mid - \;] \; \mathit{Term} \; \}^* \\
\mathit{Term} & \rightarrow & \mathit{Negation} \; \{ \; [\; '*' \mid / \;] \; \mathit{Negation} \; \}^* \\
\mathit{Negation} & \rightarrow & \{ \; ! \; \}_{opt} \; \mathit{Factor} \\
\mathit{Factor} & \rightarrow & \mathit{Identifier} \mid \mathit{Literal} \mid (\; \mathit{Expression} \;)
\end{array}
$$

BNF Grammar for Jay Syntax

$$
\begin{array}{rcl}
\textit{Program} & \rightarrow & \text{void main ( ) } \{ \; \textit{Declarations Statements} \; \} \\
\textit{Declarations} & \rightarrow & \varepsilon \;\mid\; \textit{Declarations Declaration} \\
\textit{Declaration} & \rightarrow & \textit{Type Identifiers}; \\
\textit{Type} & \rightarrow & \text{int} \mid \text{boolean} \\
\textit{Identifiers} & \rightarrow & \textit{Identifier} \;\mid\; \textit{Identifiers},\ \textit{Identifier} \\
\textit{Statements} & \rightarrow & \varepsilon \;\mid\; \textit{Statements Statement} \\
\textit{Statement} & \rightarrow & ; \mid \textit{Block} \mid \textit{Assignment} \mid \textit{IfStatement} \mid \textit{WhileStatement} \\
\textit{Block} & \rightarrow & \{ \; \textit{Statements} \; \} \\
\textit{Assignment} & \rightarrow & \textit{Identifier} \;=\; \textit{Expression} \; ; \\
\textit{IfStatement} & \rightarrow & \text{if } (\; \textit{Expression} \;) \; \textit{Statement} \;\mid \\
 & & \text{if } (\; \textit{Expression} \;) \; \textit{Statement} \text{ else } \textit{Statement} \\
\textit{WhileStatement} & \rightarrow & \text{while } (\; \textit{Expression} \;) \; \textit{Statement} \\
\textit{Expression} & \rightarrow & \textit{Conjunction} \;\mid\; \textit{Expression} \;\|\; \textit{Conjunction} \\
\textit{Conjunction} & \rightarrow & \textit{Relation} \;\mid \\
 & & \textit{Conjunction} \;\&\&\; \textit{Relation} \\
\textit{Relation} & \rightarrow & \textit{Addition} \;\mid \\
 & & \textit{Relation} \;<\; \textit{Addition} \;\mid \\
 & & \textit{Relation} \;<=\; \textit{Addition} \;\mid \\
 & & \textit{Relation} \;>\; \textit{Addition} \;\mid \\
 & & \textit{Relation} \;>=\; \textit{Addition} \;\mid \\
 & & \textit{Relation} \;==\; \textit{Addition} \;\mid \\
 & & \textit{Relation} \;!=\; \textit{Addition}
\end{array}
$$

$$\begin{aligned}
\textit{Addition} &\rightarrow \textit{Term} \mid \\
&\quad \textit{Addition} + \textit{Term} \mid \\
&\quad \textit{Addition} - \textit{Term} \\
\textit{Term} &\rightarrow \textit{Negation} \mid \\
&\quad \textit{Term} * \textit{Negation} \mid \\
&\quad \textit{Term} \,/\, \textit{Negation} \\
\textit{Negation} &\rightarrow \textit{Factor} \mid ! \, \textit{Factor} \\
\textit{Factor} &\rightarrow \textit{Identifier} \mid \textit{Literal} \mid (\, \textit{Expression} \,)
\end{aligned}$$