function	$\Rightarrow$	**\begin** **{** **eqcode** **}** **{** ***id*** **}** **{** *[idx [* **,** *idx]*]* **}** **{** *[ext_type [* **,** *ext_type]*]* **}** **{** *ext_type* **}** *instr_list* **\end** **{** **eqcode** **}**
idx	$\Rightarrow$	***id*** *[upper] [lower]* | ***num*** | *divide*
upper	$\Rightarrow$	**^** **{** **(** **[** *linear* **]** | *linear* **)** **}**
linear	$\Rightarrow$	***id*** *[(* **+** | **-** *)* ***num*** *]* | ***num***
lower	$\Rightarrow$	**_** **{** *sexpr [* **,** *sexpr]** **}**
type	$\Rightarrow$	**\type** **{** **(** **Z** | **R** | **N** | **B** **)** **}**
ext_type	$\Rightarrow$	*type [* **^** **{** ***num*** **}** *[* **_** **{** ***num*** *[* **,** ***num*** *]** **}** *]]*
instr_list	$\Rightarrow$	*[instr* **\endl** *]**
instr	$\Rightarrow$	*definition* | *declaration* | *with_loop* | *return*
definition	$\Rightarrow$	*[idx]+ expr*
boolop	$\Rightarrow$	**\land** | **\lor** | **\oplus**
binop	$\Rightarrow$	**+** | **-** | **\cdot** | *divide* | **\ll** | **\gg** | **\mod**

$$
\begin{array}{lll}
\textit{divide} & \Rightarrow & (\ \backslash\textbf{frac}\ \mid\ \backslash\textbf{dfrac}\ )\ \{\ \textit{expr}\ \}\ \{\ \textit{expr}\ \} \\[4pt]
\textit{function\_call} & \Rightarrow & \backslash\textbf{call}\ \{\ \textbf{\textit{id}}\ \}\ \{\ [\textit{idx}\ [\ \textbf{,}\ \textit{idx}\ ]^*\ ]\ \} \\[4pt]
\textit{sexpr} & \Rightarrow & (\ \backslash\textbf{lnot}\ \mid\ \texttt{-}\ )\ (\ \textbf{\textit{idx}}\ \mid\ \textit{function\_call}\ )\ [\ (\ \textit{binop}\ \mid\ \textit{boolop}\ ) \\
& & (\ \textbf{\textit{idx}}\ \mid\ \textit{function\_call}\ )\ ]^* \\
& \mid & (\ \textit{sexpr}\ ) \\[4pt]
\textit{filter} & \Rightarrow & \backslash\textbf{filter}\ \{\ \textbf{\textit{id}}\ \char`\^\ \{\ [\ \textbf{\textit{id}}\ ]\ \}\ \\
& & [\ \textbf{,}\ \textbf{\textit{id}}\ \char`\^\ \{\ [\ \textbf{\textit{id}}\ ]\ \}\ ]^* \\
& & \mid\ \textit{extended\_condition}\ \} \\[4pt]
\textit{genarray} & \Rightarrow & \backslash\textbf{genar}\ \backslash\textbf{limits}\ \char`\^\ \{\ \textit{expr}\ \}\ (\ \textit{sexpr}\ ) \\[4pt]
\textit{vector} & \Rightarrow & \backslash\textbf{begin}\ \{\ \textbf{tvector}\ \} \\
& & [\textit{sexpr}\ \backslash\textbf{endl}\ ]+ \\
& & \backslash\textbf{end}\ \{\ \textbf{tvector}\ \} \\[4pt]
\textit{matrix} & \Rightarrow & \backslash\textbf{begin}\ \{\ \textbf{tmatrix}\ \}\ \{\ [\ \textbf{\textit{id}}\ ]+\ \} \\
& & [\textit{sexpr}\ [\ \textit{sexpr}\ \textbf{\&}\ ]^*\ \backslash\textbf{endl}\ ]+ \\
& & \backslash\textbf{end}\ \{\ \textbf{tmatrix}\ \} \\[4pt]
\textit{expr} & \Rightarrow & \textit{sexpr} \\
& \mid & \textit{filter} \\
& \mid & \textit{genarray} \\
& \mid & \textit{vector} \\
& \mid & \textit{matrix} \\[4pt]
\textit{with\_loop} & \Rightarrow & \textit{with\_loop\_wbr} \\
& \mid & \textit{with\_loop\_wobr} \\[4pt]
\textit{with\_loop\_wbr} & \Rightarrow & \textit{idx}\ \mid\ \textit{extended\_condition}\ \texttt{=} \\
& & \backslash\textbf{begin}\ \{\ \textbf{cases}\ \} \\
& & [\textit{expr}\ \textbf{\&}\ \textit{extended\_condition}\ ]+ \\
& & [\textit{expr}\ \textbf{\&}\ \backslash\textbf{otherwise}\ ]+ \\
& & \backslash\textbf{end}\ \{\ \textbf{cases}\ \} \\[4pt]
\textit{with\_loop\_wobr} & \Rightarrow & \textit{idx}\ \mid\ \textit{extended\_condition}\ \texttt{=}\ \textit{expr} \\[4pt]
\textit{return} & \Rightarrow & \backslash\textbf{return}\ \{\ \textit{expr}\ \}
\end{array}
$$