HASKELL-declarations (1)

$$
\begin{array}{lcl}
\underline{\text{decls}} & \rightarrow & \{\ \underline{\text{decl}}_1 ; \ldots ; \underline{\text{decl}}_n\ \} \\
\underline{\text{decl}} & \rightarrow & \underline{\text{typedecl}} \mid \underline{\text{fundecl}} \mid \underline{\text{patdecl}} \mid \underline{\text{infixdecl}} \\
\underline{\text{typedecl}} & \rightarrow & \underline{\text{var}}_1, \ldots, \underline{\text{var}}_n \ ::\ \underline{\text{type}}, \quad n \geq 1 \\
\underline{\text{var}} & \rightarrow & \text{string starting with lower case symbol} \\
\underline{\text{fundecl}} & \rightarrow & \underline{\text{funlhs}}\ \underline{\text{rhs}}\ [\texttt{where}\ \underline{\text{decls}}] \\
\underline{\text{funlhs}} & \rightarrow & \underline{\text{var}}\ \underline{\text{pat}}_1\ \ldots \underline{\text{pat}}_n, \quad n \geq 1 \\
\underline{\text{rhs}} & \rightarrow & = \ \underline{\text{exp}} \mid \underline{\text{condrhs}}_1\ \ldots \underline{\text{condrhs}}_n, \quad n \geq 1 \\
\underline{\text{condrhs}} & \rightarrow & \mid \underline{\text{exp}}\ =\ \underline{\text{exp}}
\end{array}
$$

HASKELL-declarations (2)

$$
\begin{array}{lcl}
\underline{\text{patdecl}} & \rightarrow & \underline{\text{pat}}\ \underline{\text{rhs}}\ [\texttt{where}\ \underline{\text{decls}}] \\
\underline{\text{infixdecl}} & \rightarrow & \left\{ \begin{array}{c} \texttt{infix} \\ \texttt{infixl} \\ \texttt{infixr} \end{array} \right\}\ [\left\{ \begin{array}{c} 0 \\ 1 \\ \vdots \\ 9 \end{array} \right\}]\ \underline{\text{op}}_1, \ldots, \underline{\text{op}}_n, \quad n \geq 1 \\
\underline{\text{op}} & \rightarrow & \underline{\text{varop}} \mid \underline{\text{constrop}} \\
\underline{\text{varop}} & \rightarrow & \text{string of special symbols, not starting with :} \\
\underline{\text{constrop}} & \rightarrow & \text{string of special symbols starting with :}
\end{array}
$$

HASKELL-expressions

$$
\begin{array}{lcl}
\underline{\text{exp}} & \rightarrow & \underline{\text{var}} \\
 & \mid & \underline{\text{constr}} \\
 & \mid & \underline{\text{integer}} \\
 & \mid & \underline{\text{float}} \\
 & \mid & \underline{\text{char}} \\
 & \mid & [\underline{\text{exp}}_1, \ldots, \underline{\text{exp}}_n], \quad n \geq 0 \\
 & \mid & \underline{\text{string}} \\
 & \mid & (\underline{\text{exp}}_1, \ldots, \underline{\text{exp}}_n), \quad n \geq 0 \\
 & \mid & (\underline{\text{exp}}_1\ \ldots\ \underline{\text{exp}}_n), \quad n \geq 2 \\
 & \mid & \texttt{if}\ \underline{\text{exp}}_1\ \texttt{then}\ \underline{\text{exp}}_2\ \texttt{else}\ \underline{\text{exp}}_3 \\
 & \mid & \texttt{let}\ \underline{\text{decls}}\ \texttt{in}\ \underline{\text{exp}} \\
 & \mid & \texttt{case}\ \underline{\text{exp}}\ \texttt{of}\ \{\ \underline{\text{pat}}_1 \rightarrow \underline{\text{exp}}_1 ; \ldots ; \underline{\text{pat}}_n \rightarrow \underline{\text{exp}}_n\ \}, \quad n \geq 1 \\
 & \mid & \backslash\, \underline{\text{pat}}_1 \ldots \underline{\text{pat}}_n \rightarrow \underline{\text{exp}}
\end{array}
$$

$$
\underline{\text{constr}} \rightarrow \text{string starting with upper case symbol}
$$

HASKELL-patterns

$$
\begin{array}{lcl}
\underline{\text{pat}} & \rightarrow & \underline{\text{var}} \\
 & \mid & _ \\
 & \mid & \underline{\text{integer}} \\
 & \mid & \underline{\text{float}} \\
 & \mid & \underline{\text{char}} \\
 & \mid & \underline{\text{string}} \\
 & \mid & (\underline{\text{constr}}\ \underline{\text{pat}}_1\ \ldots\ \underline{\text{pat}}_n) \\
 & \mid & \underline{\text{var}}@\underline{\text{pat}} \\
 & \mid & (\underline{\text{var}} + \underline{\text{integer}}) \\
 & \mid & [\underline{\text{pat}}_1, \ldots, \underline{\text{pat}}_n], \quad n \geq 0 \\
 & \mid & (\underline{\text{pat}}_1, \ldots, \underline{\text{pat}}_n), \quad n \geq 0
\end{array}
$$