实验四、手工编写递归下降预测分析程序

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实验步骤 4.1、设计 Oberon-0 语言的翻译模式

$$module \longrightarrow \text{“}MODULE\text{” } identifier_1 \text{ “;”}$$
$$declaration$$
$$\text{“}BEGIN\text{”}$$
$$statement\_sequence$$
$$\text{“}END\text{” } identifier_2 \text{ “.”}$$

$$declaration \longrightarrow const\_declare \quad type\_declare \quad var\_declare \quad procedure\_declaration$$

$$const\_declare \longrightarrow \text{“}CONST\text{” } const\_list \mid \epsilon$$
$$const\_list \longrightarrow identifier \text{“=” } expression \text{“;” } const\_list \mid \epsilon$$

$$type\_declare \longrightarrow \text{“}TYPE\text{” } type\_list \mid \epsilon$$
$$type\_list \longrightarrow identifier \text{“=” } type \text{“;” } type\_list \mid \epsilon$$

$$var\_declare \longrightarrow \text{“}VAR\text{” } var\_list \mid \epsilon$$
$$var\_list \longrightarrow identifier\_list \text{“=” } type \text{“;” } var\_list \mid \epsilon$$

$$procedure\_declaration \longrightarrow procedure\_heading \text{“;”}$$
$$procedure\_body \text{“;”}$$
$$procedure\_declaration \mid \epsilon$$
$$procedure\_body \longrightarrow declaration \quad procedure\_begin \text{ “}END\text{” } identifier$$
$$procedure\_begin \longrightarrow \text{“}BEGIN\text{” } statement\_sequence \mid \epsilon$$
$$procedure\_heading \longrightarrow \text{“}PROCEDURE\text{” } identifier \quad formal\_parameters$$

$$formal\_parameters \longrightarrow \text{“(” } fp\_section \text{ “)” } \mid \epsilon$$
$$fp\_section \longrightarrow var\_if \quad identifier\_list \text{ “:” } type \mid var\_if \quad id\_list \text{ “:” } type \text{“;” } fp\_section$$
$$var\_if \longrightarrow \text{“}VAR\text{” } \mid \epsilon$$
$$type \longrightarrow identifier \mid array\_type \mid record\_type \mid \text{“}INTEGER\text{” } \mid \text{“}BOOLEAN\text{”}$$
$$array\_type \longrightarrow \text{“}ARRAY\text{” } expression \text{ “}OF\text{” } type$$
$$record\_type \longrightarrow \text{“}RECORD\text{” } field\_list \text{ “}END\text{”}$$
$$field\_list \longrightarrow field\_one \mid field\_one \text{ “;” } field\_list$$
$$field\_one \longrightarrow identifier\_list \text{ “:” } type \mid \epsilon$$

$$identifier\_list \longrightarrow identifier \mid identifier \text{ “;” } identifier\_list$$
$$statement\_sequence \longrightarrow statement \mid statement \text{ “;” } statement\_sequence$$
$$statement \longrightarrow assignment \mid procedure\_call \mid if\_statement \mid while\_statement \mid read\_write \mid \epsilon$$

$$while\_statement \longrightarrow \text{“}WHILE\text{” } expression \text{ “}DO\text{” } statement\_sequence \text{ “}END\text{”}$$

$$if\_statement \longrightarrow \text{“}IF\text{” } expression \text{ “}THEN\text{” } statement\_sequence \quad elsif\_statement \quad else\_statement$$
$$elsif\_statement \longrightarrow \text{“}ELSIF\text{” } expression \text{ “}THEN\text{” } statement\_sequence \quad elsif\_statement \mid \epsilon$$
$$else\_statement \longrightarrow \text{“}ELSE\text{” } statement\_sequence \text{ “}END\text{” } \mid \epsilon$$

$$\begin{aligned}
read\_write \longrightarrow\ & \text{``}READ\text{''}\ \text{``}LPAREN\text{''}\ identifier\ \text{''}RPAREN\text{''} \\
& |\text{``}WRITE\text{''}\ \text{``}LPAREN\text{''}\ identifier\ \text{''}RPAREN\text{''} \\
& |\text{``}WRITELN\text{''}\ \text{``}LPAREN\text{''}\ identifier\ \text{''}RPAREN\text{''} \\
& |\text{``}WRITELN\text{''}\ \text{``}LPAREN\text{''}\ \text{''}RPAREN\text{''}
\end{aligned}$$

$$\begin{aligned}
procedure\_call \longrightarrow\ & identifier\ actual\_parameters \\
actual\_parameters \longrightarrow\ & \text{``(''}\ \text{``)''}\ |\ \text{``(''}\ parameters\_list\ \text{``)''}\ |\ \epsilon \\
parameters\_list \longrightarrow\ & expression\ |\ expression\ \text{``,''}\ parameters\_list \\
assignment \longrightarrow\ & identifier\ selector\ \text{``:=''}\ expression \\
expression \longrightarrow\ & simple\_expression1\ compare\_operation\ simple\_expression2 \\
compare\_operation \longrightarrow\ & \text{``=''}\ |\ \text{``\#''}\ |\ \text{``<''}\ |\ \text{``>''}\ |\ \text{``<=''}\ |\ \text{``>=''} \\
simple\_expression \longrightarrow\ & term\ |\ term\ cal\_operation1\ simple\_expression \\
cal\_operation1 \longrightarrow\ & \text{``+''}\ |\ \text{``-''}\ |\ \text{``}OR\text{''} \\
term \longrightarrow\ & factor\ |\ factor\ cal\_operation2\ simple\_expression \\
cal\_operation2 \longrightarrow\ & \text{``}*\text{''}\ |\ \text{``}DIV\text{''}\ |\ \text{``}MOD\text{''}\ |\ \text{``\&''} \\
factor \longrightarrow\ & identifier\ |\ identifier\ selector\ |\ NUMBER\ |\ \text{``(''}\ expression\ \text{``)''}\ |\ \text{``}\sim\text{''}\ factor \\
selector \longrightarrow\ & \text{``.''}\ identifier\ |\ \text{``[''}\ expression\ \text{``]''} \\
identifier \longrightarrow\ & letter\ identifier\_list \\
identifier\_list \longrightarrow\ & letter\ identifier\_list\ |\ digit\ identifier\_list\ |\ \epsilon
\end{aligned}$$

由于这个期末事情较多而接下来的任务又比较复杂，很遗憾我实在是没有时间和精力继续完成接下来的任务了，在这里向老师和助教表达歉意。