Correction de l'exercice 1

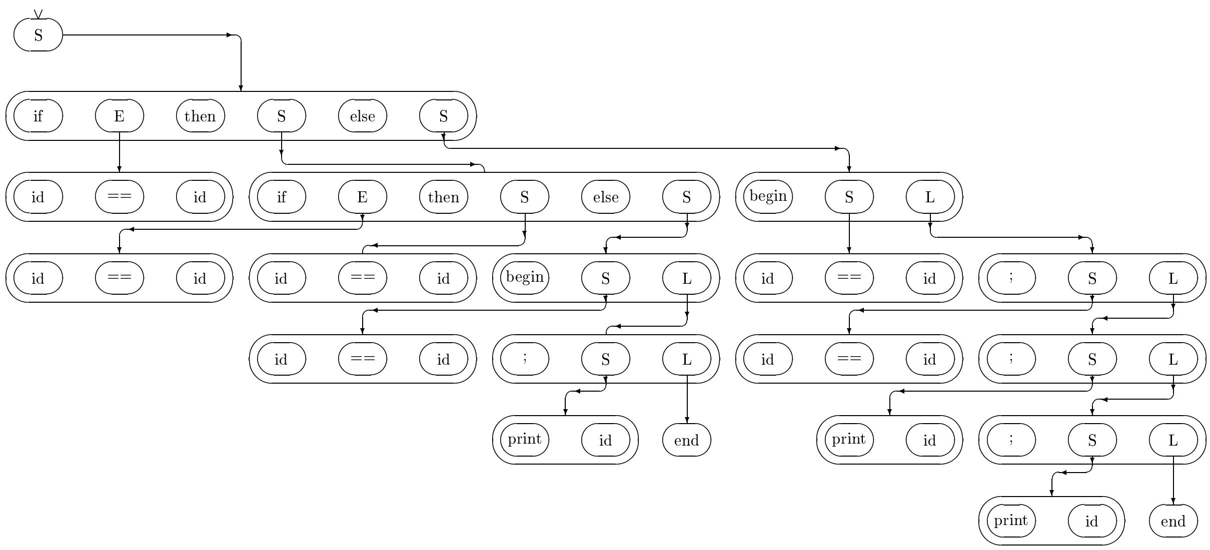

Figure 1: Arbre de dérivation

Correction de l'exercice 2

1. $$\begin{array}{lcl} S & \longrightarrow & TU \\ T & \longrightarrow & aTb \mid \epsilon \\ U & \longrightarrow & cU \mid \epsilon \end{array}$$

2. $$\begin{array}{lcl} S & \longrightarrow & TU \mid T^1U^1 \\ T & \longrightarrow & aTb \mid \epsilon \\ U & \longrightarrow & cU \mid \epsilon \\ T^1 & \longrightarrow & aT^1 \mid \epsilon \\ U^1 & \longrightarrow & bU^1c \mid \epsilon \end{array}$$

3. $S \longrightarrow aSa \mid bSb \mid cSc \mid a \mid b \mid c \mid \epsilon$

Correction de l'exercice 3

1. $$S \longrightarrow \{SL|\ instr\ ;\ |\ ;\ |\epsilon$$
$$L \longrightarrow SL|\}$$

2. $$S \longrightarrow begin\ SL|\ instr\ |\epsilon$$
$$L \longrightarrow\ ;\ SL|\ end$$

3. *Une solution basée sur l'automate sous-jacent.*

$$
\begin{aligned}
S &\longrightarrow A\ S_a \mid B\ S_b \mid C\ S_c \mid D\ S_d \mid \epsilon \\
S_a &\longrightarrow B\ S_{ab} \mid C\ S_{ac} \mid D\ S_{ad} \mid \epsilon \\
S_b &\longrightarrow A\ S_{ab} \mid C\ S_{bc} \mid D\ S_{bd} \mid \epsilon \\
S_c &\longrightarrow A\ S_{ac} \mid B\ S_{bc} \mid D\ S_{cd} \mid \epsilon \\
S_d &\longrightarrow A\ S_{ad} \mid B\ S_{bd} \mid C\ S_{cd} \mid \epsilon \\
S_{ab} &\longrightarrow C\ S_{abc} \mid D\ S_{abd} \mid \epsilon \\
S_{ac} &\longrightarrow B\ S_{abc} \mid D\ S_{acd} \mid \epsilon \\
S_{ad} &\longrightarrow B\ S_{abd} \mid C\ S_{acd} \mid \epsilon \\
S_{bc} &\longrightarrow A\ S_{abc} \mid D\ S_{bcd} \mid \epsilon \\
S_{bd} &\longrightarrow A\ S_{abd} \mid C\ S_{bcd} \mid \epsilon \\
S_{cd} &\longrightarrow A\ S_{acd} \mid B\ S_{bcd} \mid \epsilon \\
S_{abc} &\longrightarrow D \mid \epsilon \\
S_{abd} &\longrightarrow C \mid \epsilon \\
S_{acd} &\longrightarrow B \mid \epsilon \\
S_{bcd} &\longrightarrow A \mid \epsilon \\
A &\longrightarrow \textit{public} \\
B &\longrightarrow \textit{static} \\
C &\longrightarrow \textit{final} \\
D &\longrightarrow \textit{transient}
\end{aligned}
$$

Correction de l'exercice 4

Deux solutions : une avec ϵ et l'autre sans.

$$
\begin{aligned}
S_0 &\longrightarrow 0\ S_1 \mid 1\ S_5 \\
S_1 &\longrightarrow 1\ S_2 \mid 0\ S_6 \\
S_2 &\longrightarrow 1\ S_3 \mid 0\ S_7 \mid \epsilon \\
S_3 &\longrightarrow 0\ S_8 \\
S_5 &\longrightarrow 0\ S_6 \mid 1\ S_6 \\
S_6 &\longrightarrow 0\ S_7 \mid 1\ S_7 \\
S_7 &\longrightarrow 0\ S_8 \mid 1\ S_8 \\
S_8 &\longrightarrow 0\ S_8 \mid 1\ S_8 \mid \epsilon
\end{aligned}
$$

$$
\begin{aligned}
S_0 &\longrightarrow 0\ S_1 \mid 1\ S_5 \\
S_1 &\longrightarrow 1\ S_2 \mid 0\ S_6 \mid 1 \\
S_2 &\longrightarrow 1\ S_3 \mid 0\ S_7 \\
S_3 &\longrightarrow 0\ S_8 \mid 0 \\
S_5 &\longrightarrow 0\ S_6 \mid 1\ S_6 \\
S_6 &\longrightarrow 0\ S_7 \mid 1\ S_7 \\
S_7 &\longrightarrow 0\ S_8 \mid 1\ S_8 \mid 0 \mid 1 \\
S_8 &\longrightarrow 0\ S_8 \mid 1\ S_8 \mid 0 \mid 1
\end{aligned}
$$