



Figure 4.31: LR(0) automaton for the expression grammar (4.1)

Intuitively, $A \rightarrow \alpha \cdot B \beta$ in $\text{CLOSURE}(I)$ indicates that, at some point in the parsing process, we think we might next see a substring derivable from $B\beta$ as input. The substring derivable from $B\beta$ will have a prefix derivable from B by applying one of the B -productions. We therefore add items for all the B -productions; that is, if $B \rightarrow \gamma$ is a production, we also include $B \rightarrow \cdot \gamma$ in $\text{CLOSURE}(I)$.

Example 4.40 : Consider the augmented expression grammar:

$$\begin{array}{lcl}
 E' & \rightarrow & E \\
 E & \rightarrow & E + T \mid T \\
 T & \rightarrow & T * F \mid F \\
 F & \rightarrow & (E) \mid \text{id}
 \end{array}$$

If I is the set of one item $\{[E' \rightarrow \cdot E]\}$, then $\text{CLOSURE}(I)$ contains the set of items I_0 in Fig. 4.31.