Here is one way that we might consider defining the \texttt{for}-loop. Let $j$, $n$, $k$ and $m$ be integer expressions, and let $i$ be a fresh name.

\begin{align*}
\text{for } i := \text{nil do } P \text{ od} & = \text{ok} \\
\text{for } i := j \text{ do } P \text{ od} & = \text{(substitute } j \text{ for } i \text{ in } P) \\
\text{for } i := n ;..k ;..m \text{ do } P \text{ od} & = \text{for } i := n ;..k \text{ do } P \text{ od. for } i := k ;..m \text{ do } P \text{ od}
\end{align*}

(a) From this definition, what can we prove about \texttt{for } i := 0 ;..n \text{ do } n := n + 1 \text{ od} where $n$ is an integer variable?

(b) What kinds of \texttt{for}-loop are in the programming languages you know?