(string replacement) Let $S$ and $T$ be strings. Let $n$ and $m$ be such that
\[ n, m: 0\ldots \leftrightarrow S+1 \land n \leq m \]
Design a notation and axiom for a string expression that means a string like $S$ except that the substring of $S$ from index $n$ to index $m$ is replaced by string $T$. If $n=m$ then it is insertion of $T$ at index $n$. If $T=nil$ then it is deletion of the substring from $n$ to $m$. If $n=m=\leftrightarrow S$ then it is appending $T$ to the end of $S$. If $n=m=0$ then it is prepending $T$ to the front of $S$.

After trying the question, scroll down to the solution.
This is a generalization of $S^n i$, so I'll use the notation $S^{n..m} T$. The axiom could be

$$S;T;U \iff S \iff S + \iff T \iff V = S;V;U$$

or it could be: for $0 \leq n \leq m \leq \iff S$

$$S^{n..m} T = S_{0..n}; T; S_{m..\iff S}$$