61 (string replacement) Let S and T be strings. Let n and m be such that

$$n, m: 0,..\leftrightarrow S+1 \wedge n \leq m$$

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 $S \triangleleft n \triangleright i$, so I'll use the notation $S \triangleleft n;..m \triangleright T$. The axiom could be

$$S;T;U \triangleleft \leftrightarrow S\ ;.. \leftrightarrow S + \leftrightarrow T \triangleright V \quad = \quad S;V;U$$

or it could be: for $0 \le n \le m \le \leftrightarrow S$

$$S \triangleleft n;..m \triangleright T \ = \ S_{0;..n};\ T;\ S_{m;..\leftrightarrow S}$$