dfs.

This problem is NP-Complete, because we can reduce 3-SAT to this.
1. Force $| \leftrightarrow |$, by setting the pattern to be $|\cdots|$ and the string to be $|\cdots|$.
2. Assume we have already constructed a 1-1 mapping between k variables in the pattern and $\{1^i | 1 \leq i \leq k\}$ in the string. We can construct a 1-1 mapping between k' new variables in the pattern and $\{1^i | k+1 \leq i \leq k+k'\}$ in the string, using the following structure: $|v_1 \dots v_{k'}| \leftrightarrow |1^{\sum_{i=k+1}^{k+k'}}|$. Therefore, $|xx'| \leftrightarrow |1^{2\ell_x+1}|$ ensures either $x = 1^{\ell_x}$ (indicating x is false) or $x = 1^{\ell_x+1}$ (x is true). For the i-th clause in 3-SAT, we can create a corresponding variable t_i, and force $t_i = 1^j$, where j satisfies $\ell_i \leq j \leq \ell_i + 2$.
3. Now, the i-th clause $(x \vee y \vee z)$ in the 3-SAT instance is mapped to $|xyzt_i|$ in the pattern, and set the corresponding part of the string to be $|1^{\ell_x+\ell_y+\ell_z+\ell_i+3}|$.
The total length of the string is $O(n^2)$.

References