Algorithm 1 LCPSLength(X,Y)

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$n \leftarrow length[X]$
for $i = 1$ to $n$ do
    for $j = 1$ to $i$ do
        for $k = 1$ to $n$ do
            for $\ell = 1$ to $k$ do
                if ($i = j$ or $k = \ell$) and (either of $x_i$ or $x_j$ equals either of $y_k$ or $y_\ell$)) then
                    $lcps[i, j, k, \ell] = 1$
                else
                    $lcps[i, j, k, \ell] = 0$
                end if
            end for
        end for
    end for
end for
for $xLength = 2$ to $n$ do
    for $yLength = 2$ to $n$ do
        for $i = 1$ to $n - xLength + 1$ do
            for $k = 1$ to $n - yLength + 1$ do
                $j = i + xLength$
                $\ell = k + yLength$
                if $x_i = x_j = y_k = y_\ell$ then
                    $lcps[i, j, k, \ell] = 2 + lcps[i + 1, j - 1, k + 1, \ell - 1]$
                else
                    $lcps[i, j, k, \ell] = \max(lcps[i + 1, j, k, \ell], lcps[i, j - 1, k, \ell], lcps[i, j, k + 1, \ell], lcps[i, j, k, \ell - 1])$
                end if
            end for
        end for
    end for
end for
return $lcps$
```

$$lcps[i, j, k, \ell] = \begin{cases} 0 & i > j \text{ or } k > \ell \\ 1 & (i = j \text{ or } k = \ell) \\ & \text{ and} \\ & (\text{either of } x_i \text{ or } x_j \\ & \text{equals} \\ & \text{either of } y_k \text{ or } y_\ell) \\ 2 + lcps[i + 1, j - 1, k + 1, \ell - 1] & (i < j \text{ and } k < \ell) \\ & \text{and} \\ & x_i = x_j = y_k = y_\ell \\ \max(lcps[i + 1, j, k, \ell], lcps[i, j - 1, k, \ell], & \\ lcps[i, j, k + 1, \ell], lcps[i, j, k, \ell - 1]) & (i < j \text{ and } k < \ell) \\ & \text{and} \\ & \text{the condition } (x_i = x_j = y_k = y_\ell) \\ & \text{does not hold} \end{cases} \qquad (3)$$

The length of an *LCPS* between X and Y shall be stored at $lcps[1, n, 1, n]$. Since there are $\Theta(n^4)$