Let us call a string $S: \{\text{"a"}, \text{"b"}, \text{"c"}\}$ a $T$-string if no two adjacent nonempty segments are identical:

$$\neg \exists i, j, k \cdot 0 \leq i < j < k \leq |S| \land S_{i:j} = S_{j:k}$$

Write a program to output all $T$-strings in alphabetical order. (The mathematician Thue proved that there are infinitely many $T$-strings.)

Define $R := \text{(print all $T$-strings in alphabetical order)}$.
Define $Z := \text{(print all $T$-strings from $S$ on in alphabetical order)}$.
Define $T := (S$ is a $T$-string) $= \neg \exists i, j, k \cdot 0 \leq i < j < k \leq |S| \land S_{i:j} = S_{j:k}$.
Define $U := (S$ has no adjacent nonempty identical segments of length < $l) \iff \neg \exists i, j, k \cdot 0 \leq i < j < k \leq |S| \land j - i < l \land S_{i:j} = S_{j:k}$.

\[
\begin{align*}
R & \iff \text{S := \""
T} & \iff Z
T & \iff \text{S := S;\"a". Z}
Z & \iff i := 1. \ U & \iff Z
U & \iff Z \\
\text{if} & \iff S \geq 2xi
\text{then} & \iff S := S_{2xi:..}S_{-i} = S_{-i:..}S
\text{then} & \text{S := (the alphabetically next text that is not longer). Z}
\text{else} & \text{i := i + 1. } \ U & \iff Z \text{ fi}
\text{else} & \text{T &} \iff Z \text{ fi}
S := (the alphabetically next text that is not longer) \iff
\text{if} & \iff S_{-1} = \text{"a"} \text{ then} S := S_{0:..}S_{-1};\text{"b"}
\text{else if} & \iff S_{-1} = \text{"b"} \text{ then} S := S_{0:..}S_{-1};\text{"c"}
\text{else} & S := S_{0:..}S_{-1}. \ S := (the alphabetically next text that is not longer) \text{ fi fi}
\end{align*}
\]

The one insight is the fact that a non-$T$-string cannot be made into a $T$-string by extending it, hence the assignment $S := (the$ alphabetically next text that is not longer) . We are assured that there is one by Thue.