(T-strings) Let us call a string $S$: *(“a”, “b”, “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 Axel Thue proved that there are infinitely many T-strings.)

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Define $R \Leftarrow (\text{print all T-strings in alphabetical order})$.
Define $Z \Leftarrow (\text{print all T-strings from } S \text{ on in alphabetical order})$.
Define $T \Leftarrow (S \text{ is a T-string}) \equiv \neg \exists i, j, k \cdot 0 \leq i < j < k \leq S \land S_{i:j} = S_{j:k}$.
Define $U \Leftarrow (S \text{ has no adjacent nonempty identical segments of length } < l)$
\[ \equiv \neg \exists i, j, k \cdot 0 \leq i < j < k \leq S \land j - i < l \land S_{i:j} = S_{j:k} . \]
$R \Leftarrow S := "$  .  $T \Rightarrow Z$
$T \Rightarrow Z \Leftarrow !S.  S := S; "a".  Z$
$Z \Leftarrow i := 1.  U \Rightarrow Z$
$U \Rightarrow Z \Leftarrow$
if $S \geq 2 \times i$
then if $S_{i:2 \times i} = S_{i:2 \times i}$
then $S :=$ (the alphabetically next text that is not longer).  $Z$
else $i := i + 1.  U \Rightarrow Z$
else $T \Rightarrow Z$
$S :=$ (the alphabetically next text that is not longer) \( \Leftarrow $
if $S_{i:1} = "a" \text{ then } S := S_{0:i} ; "b"$
else if $S_{i:1} = "b" \text{ then } S := S_{0:i} ; "c"$
else $S := S_{0:i} ; S_{i:1}.$  $S :=$ (the alphabetically next text that is not longer) \( \text{fi fi} \)

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.