Design a String Recognizer to output \( \text{true} \) if a pattern (including current input) is a palindrome.

ex. 010 → T
     1111 → T
     110  → F

Less gates = better :)
Input 1: 010010111001000011111010

Input 2: 111010111000001001101101

If two strings have two consecutive identical inputs, output that.

For example, if two consecutive inputs are 01001, output 01001.

In 2: 01001

Out: 01001
Convert all the gates in any NAND or NOR gates or inverters.

Simplified possible circuit can have both NAND and NOR.
For each state, for each legal input pattern,

* There must be a matching edge

\[ A \xrightarrow{} \hat{A} \]

* There must not be more than one matching edge

\[ A \xrightarrow{a} B \xrightarrow{} AB \]

Redundant Rule: If two states output the same for all legal input patterns, the states are redundant.
Use the circuit diagram below to draw the state diagram.

\[ P_{S1} = \overline{P_{SO}} \]

\[ N_{S1} = \overline{IN} \]

\[ P_{SO} = P_{S1} \oplus \overline{IN} \]

- Initial states:
  - 00
  - 01
  - 10
  - 11

- Transitions:
  - 00 to 01 on 0/1
  - 00 to 10 on 1/1
  - 11 to 10 on 0/1
  - 11 to 01 on 1/1

- Reset:
  - Reset state goes to 00
Question:
Find the Boolean Equation corresponding to this K-map.

OUT = ?
\[ \overline{AC} + AB \]