Design a Turing Machine that decides the language expressed by the regular expression
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$(s, \underline{\#}\ \omega): ID$ (s: starting state)

$\underline{\#}\omega:$ tape content)

$$L = \{a^n b^m a^k \mid n, k > 0 ; m > 1\}$$

TM	Condition	Next TM
>A	—	R.B
B	$\sigma = a$	$R_{\{b,\#\}}$. C
	$\sigma \neq a$	h_{no}
C	$\sigma = \#$	h_{no}
	$\sigma = b$	R.D
D	$\sigma = b$	$R_{\{a,\#\}}$. E
	$\sigma \neq b$	h_{no}

TM	Condition	Next TM
E	$\sigma = a$	$R_{\{b,\#\}}$. F
	$\sigma = \#$	h_{no}
F	$\sigma = b$	h_{no}
	$\sigma = \#$	h_{yes}

Design a Turing Machine that decides $L = \{w \in \Sigma^* \mid w = w^r;\ w^r$ denotes the string written in the reverse direction$\}$ where the initial configuration is $(s, \underline{\#}w)$.

TM	Condition	Next TM	
$> A$	–	$R.B$	
B	$\sigma = x \neq \#$	$\# R_{\#}.L.C$	
B	$\sigma = \#$	h_{yes}	$\rightarrow$ even length
C	$\sigma = x$	$\#.L_{\#}.R.B$	
C	$\sigma \neq x \wedge \sigma \neq \#$	h_{no}	
C	$\sigma = \#$	h_{yes}	$\rightarrow$ odd length