Given $<M,w>$, can we decide that $M$ makes 3 consecutive right head movement on $w$?

$L'(M) = \emptyset$

$L(M')$ is recursive

$L_a = \{ <M> \mid L(M) = a \}$ for $a \in \Sigma^*$

Consider some non-recursive language $L_1$ and try to reduce $L_1 \leq_f L'$

Choose $L_1 = L_w$
Input $L_n : \langle M, w \rangle$

" " " $L' : \langle M, w \rangle$

$f(M, w) \rightarrow \langle M', w' \rangle$

s.t. M accepts w if M' makes 3 consecutive right moves

$\delta (q, \Gamma) : (\Phi, \Gamma_2, R)$

$\left[ q, i \right] \rightarrow \left[ q, 2 \right]$

$\langle M \rangle$ is modified to $\langle M' \rangle$ which makes 3 consecutive right moves.

If M accepted w

$w = w'$
What happens when a TM is not allowed to write on the tape?

We can actually simulate this machine using an NFA

\[ \begin{array}{c|c|c|c|c} & a & b & c & d \\ \hline q_1 & q_2 & q_3 & q_4 & q_5 \\ \end{array} \]

\[ \delta : Q \times \Sigma \rightarrow Q \times \{L, R\} \]

Crossing Sequence

# crossing sequences is finite.