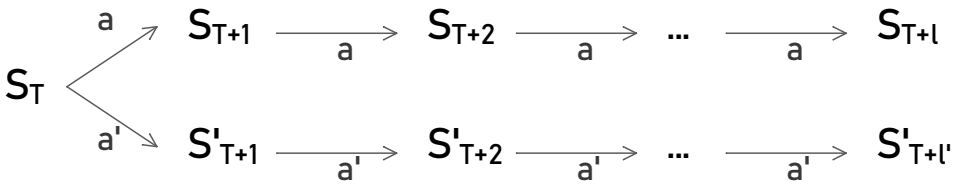
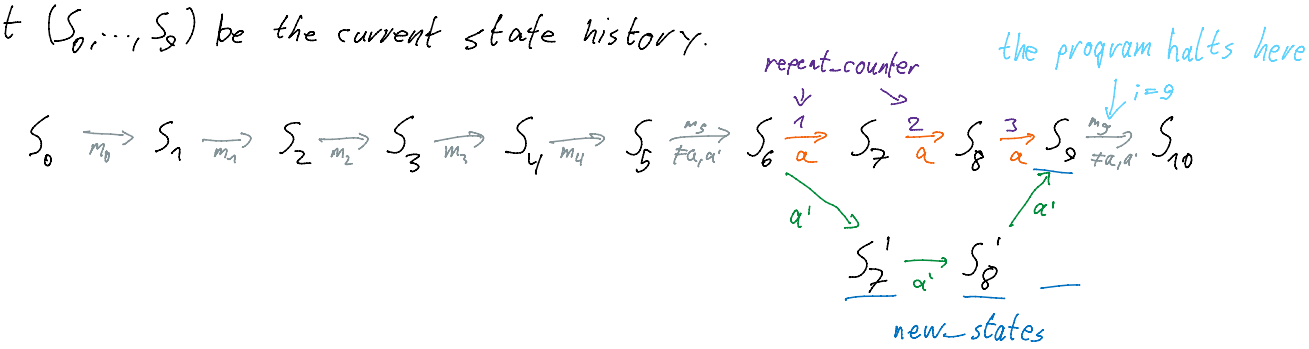
# Scramble shortening

Montag, 31. August 2020 13:36




Assume an action $a$ of order $n \geq 6$ with inverse $a'$.
Let $(S_0, \dots, S_9)$ be the current state history.




$S_6 = state_hist[i - repeat_counter]$

$\{S_6, S_7, S_8, S_9\} = state_hist[i - repeat_counter : i+1]$

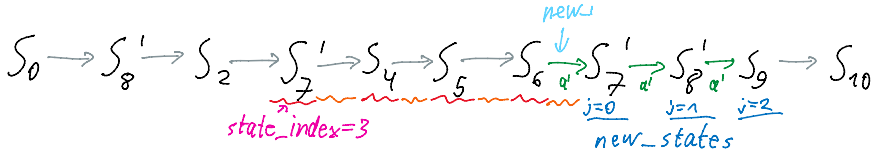
$\{m_6, m_7, m_8\} = scramble_hist[i - repeat_counter : i]$

Assume $S'_7, S'_8 \in \{S_0, \dots, S_5\}$. $\Rightarrow$ only possible if $n > 3$

**Case 1:** Assume $S'_7$ occurs after $S'_8$.

Without loss of generality assume $S_1 = S'_8$ and $S_3 = S'_7$.

current state history: repeat_counter = 3 i=9




$new_i = i - repeat_counter + 1$

delete marked (4) states and actions ($4 = new_i - state_index$; 7 − 3)

Loop run 0: j=0 new_i = 7

delete from new (7) states and actions (4 = new_i - state_index / 7 = 3)

loop run 0: j=0 new_i = 7

Goal: $S_0 \to S_8' \to S_2 \to S_7' \xrightarrow{a'} S_8' \xrightarrow{a'} S_9 \to S_{10}$

del(state_hist[state_index: new_i]) ~ delete states

del(scramble_hist[state_index: new_i]) ~ delete actions

We have to update new_i, otherwise it points to the wrong elements. afte we shortened the lists.

new_i = state_index + 1 if shortened else new_i + 1

loop run 1: j=1 new_i = 4 new_i

prev.: $S_0 \to S_8' \to S_2 \to S_7' \xrightarrow{a'} S_8' \xrightarrow{a'} S_9 \to S_{10}$

Goal: $S_0 \to S_8' \xrightarrow{a'} S_9 \to S_{10}$