

To start from an fc word w , right justify it, and produce the factors of the canonical basis set, the two key technicalities are:

(1) Make sure every internal letter keeps both its lateral witnesses immediately to its left and right, except for those internal b_2 's witnessed by a bilateral b_1 on the right. ^{necessary to ensure this.}

(on the other hand, if we get a 1/2-string $|2$ where the 2 is not internal, we should release/yield the 1 to the left to accompany any internal 2 it may witness. eg. $|\bar{2}3|24$)

(2) Telling $S_2 \bar{S}_1 S_2$ apart from $S_2 \bar{S}_1 S_2$ to make the correct f -factor assignment.
 difference: whether there's a 1 on the right

Thus, we'll use two tracks along w/ 12 - (set decomposition):

(1) yield, either (1,) or (,) ;
to do not to do

(2) one-on-right, either True or False

Note: (a) We can yield the 1, i.e., we have $yield = (1,)$,
only if $one_on_right = True$.

(b) We'll only yield a 1 on the very left of a (set) parabolic part if the parabolic is 1 or 2 where 2 is not internal.

(c) By (b), a 1 yielded to the left can be kept on the left.

The algorithm:

$$w = x \mid_2 y$$

x ends w/ rightmost 2 in w

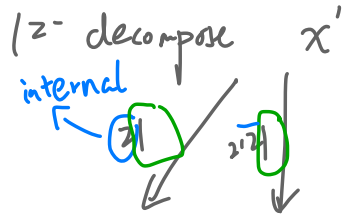
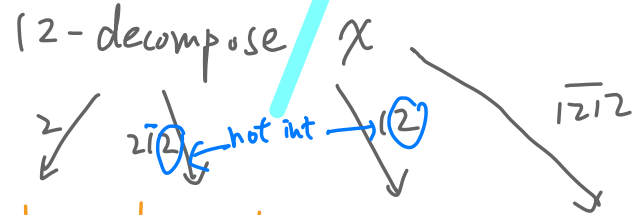
$l \in y$
 $yield = (1)$
 $one-on-right = True$

e.g. $w = 231$
 can think of 2 as a
 fine coset dec. parabola
 (so yield it)

$$x' = x1, y = |y'$$

record the letters in y' to factor, x_I

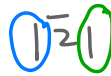
($\notin y$)
 $yield = (,)$
 $one-on-right = False$



x'_I : not internal

$x'_I \rightarrow : b_2 b_1, b_2 b_1 b_2 b_1$
 $- 2 b_2 b_1$

x'^I : no 1 or 2, easy



$b_1 b_2 b_1 - b_1$
 don't yield 1

$x_I \rightarrow x^I$

$b_2, b_2 b_1 b_2 - b_2$
 no 1 or 2, easy

yield 1 (by 2)
 record only b_2 ,
 (record the yield b_1 later.)

$b_1 b_2 b_1 b_2 - 2 b_2 b_1$
 don't yield

Set one-on-right to True.
 run recursion w/ $w = x'^I / x^I$.