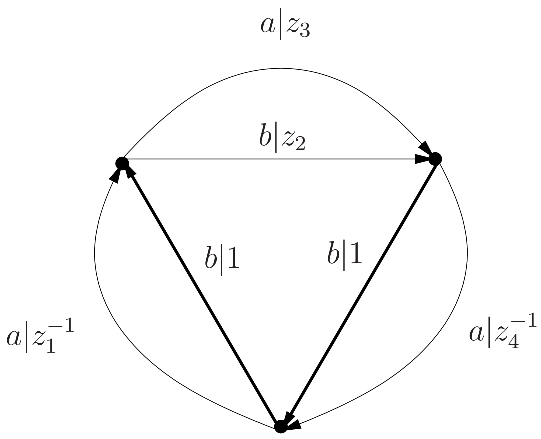

Example 0.1. $F_1 = F(a,b)$, $F_2 = F(a',b')$, $H_1 = \langle ba^{-1}, b^3, bab, a^{-1}b\rangle$, H_2 is the same with a' instead of a and b' instead of b. ϕ_1 maps z_1 to ba^{-1}, z_2 to b^3, z_3 to bab and z_4 to $a^{-1}b$. ϕ_2 does the same but with the $'$ added. H_k is normal in F_k. The Stallings folding for H_1 is shown in the figure.

Now,

$$a'a(a^{-1}b)a^{-1}a'^{-1} = a'(ba^{-1})a'^{-1} = a'b'a'^{-1}a'^{-1} = a'b'a'^{-2},$$

so

$$\begin{aligned} a'a(a^{n-1}ba^{-n})a^{-1}a'^{-1} &= a'(a^nba^{-(n+1)})a'^{-1} \\ &= a'(a'^nb'a'^{-(n+1)})a'^{-1} \\ &= a'^{n+1}b'a'^{-(n+2)}, \end{aligned}$$

an element of one syllable, for all n.

In fact, for any element w of the free group on $\{a,b\} \cup \{a',b'\}$ $wa^{n-1}ba^{-n}w^{-1}$ will be an element of one syllable. Can you write a loop to input a word w and test this, for values of n from 0 to ... n?

Example 0.2. Take F_i, H_i to be as in Examples 2.8 and 2.9 of the paper on the membership problem. Stallings foldings are shown in the paper. Check the amalgamate program works with the following.
$x_1x_2y_1^2x_1^2$ is already in reduced form.
$x_1x_2y_1^2x_1^3$ has reduced form $x_1x_2y_1^2y_3y_4$
$x_1x_2y_1^2x_1^3y_4^{-1}y_1^{-1}y_2^{-1}$ has reduced form $x_1x_2x_1x_2x_3x_1^{-3}$.