Example Case 2

s_i is a leaf s_{i+1} is removed by a conjugate
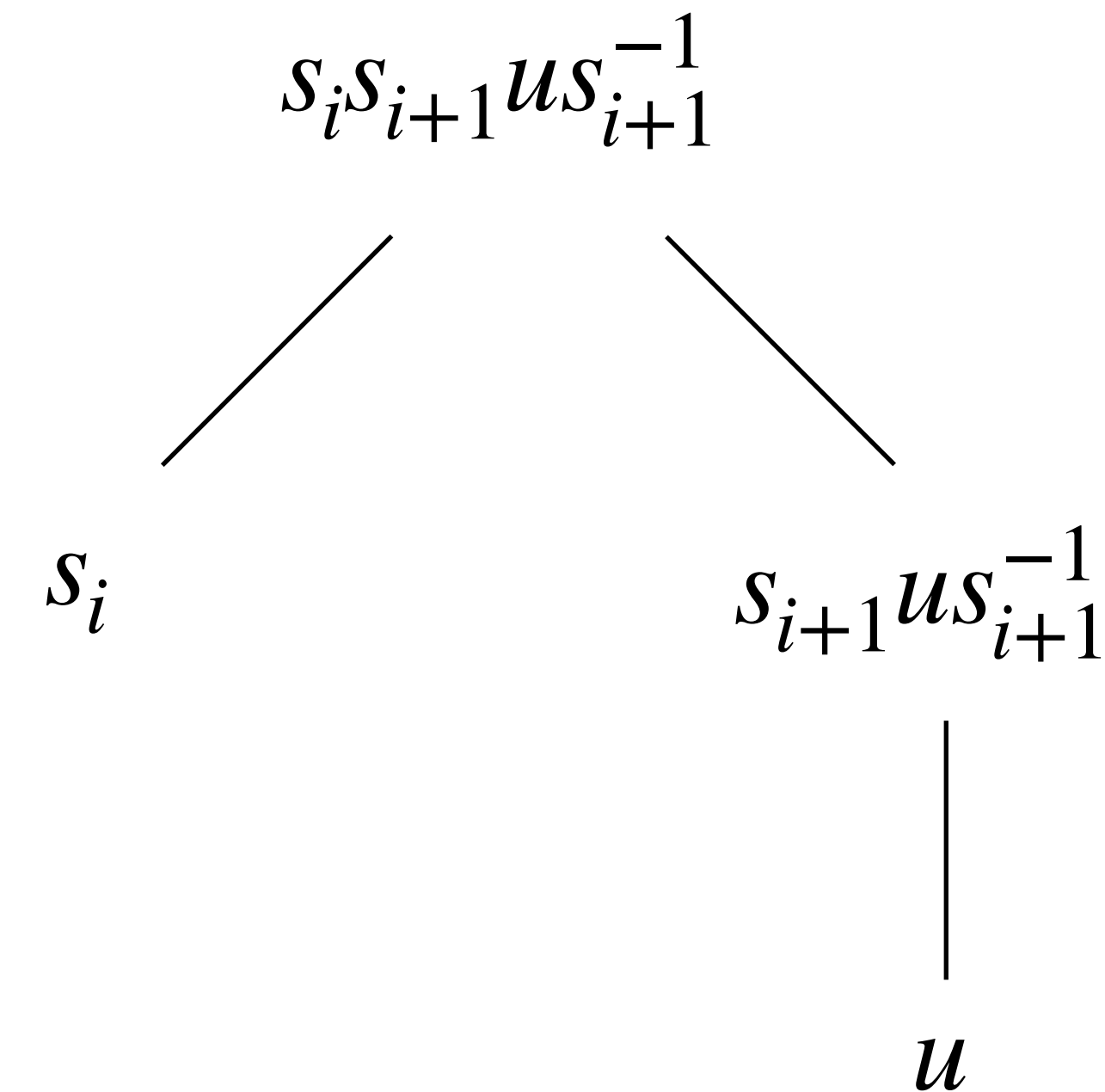node, and s_i is its descendent

$v = s_i s_{i+1} u s_{i+1}^{-1}$ where u is a string

Assume s_i and $s_{i+1} w_1 s_{i+1}^{-1}$ are children.

$\rho(v) = \rho(s_i) + C(s_{i+1} u s_{i+1}^{-1}) = 1 + \rho(u)$

After reduction:

$\rho(v') \leq \rho(u s_{i+1}^{-1}) \leq \rho(u) + \rho(s_{i+1}^{-1}) = \rho(u) + 1$

$s_i s_{i+1} u s_{i+1}^{-1}$

s_i

$s_{i+1} u s_{i+1}^{-1}$

u

Conclusion

- Check all 9 cases.

- Conclude there exists an expression tree T' for w' where $L(T') \leq L(T)$.

$\Rightarrow \rho(w') \leq \rho(w)$