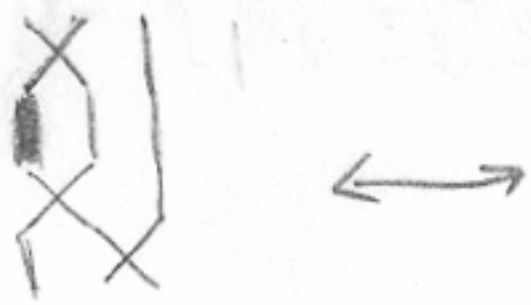
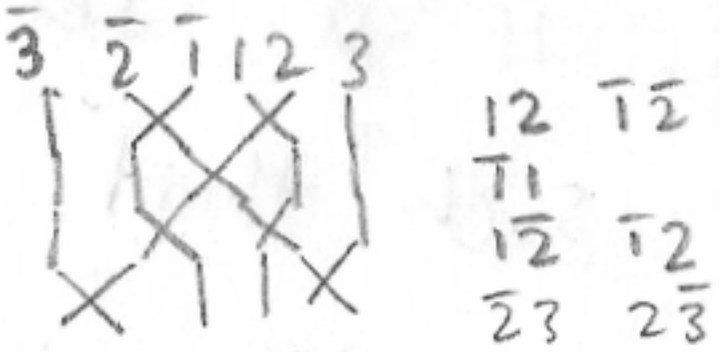
Ex S_n^B is a Coxeter group.

Pf: represent elements by symmetric braids



$s_2 s_1 s_0 s_1$



$s_2 s_1 s_0 s_1$

$12 \quad \bar{1}\bar{2}$
$\bar{1}1$
$1\bar{2} \quad \bar{1}2$
$\bar{2}3 \quad 2\bar{3}$

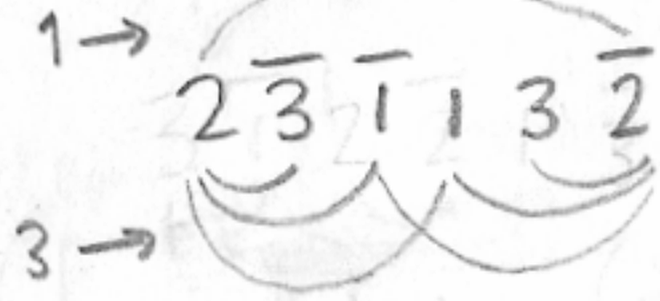
$1 3 \bar{2}$

$2\bar{3}\bar{1}13\bar{2}$

length = # of "inversions" wrt $\bar{n} < \dots < \bar{2} < \bar{1} < 1 < \bar{2} < \dots < n$

- $(i\,\bar{i})$ counts as one
- $\{(i\,j), (-i\,-j)\}$ counts as one

Ex: $\ell(1\,3\,\bar{2})$:



$\bar{3} < \bar{2} < \bar{1} < 1 < 2 < 3$

$\ell(1\,3\,\bar{2}) = 4$

If $\ell(tw) < \ell(w)$, it's because t undoes a crossing that already took place

$w = s_1 \dots s_k$

$\downarrow$

$tw = s_1 \dots \hat{s_i} \dots s_k$

$\Rightarrow$ Exchange property holds

$\Rightarrow$ Coxeter group