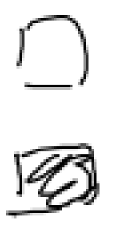
"All relations in $H^* BS_n$ follow from Hopf ring distributivity.

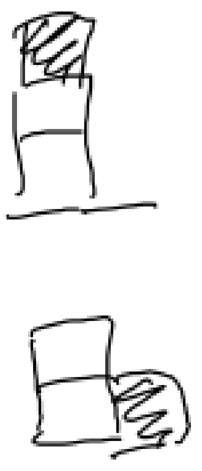
Hopf ring distributivity results in more subtle relns.

"Digression" Consider $\mathbb{F}_2[x_1, \ldots x_n, y_1 \ldots y_n]^{S_n}$

 — x

— y

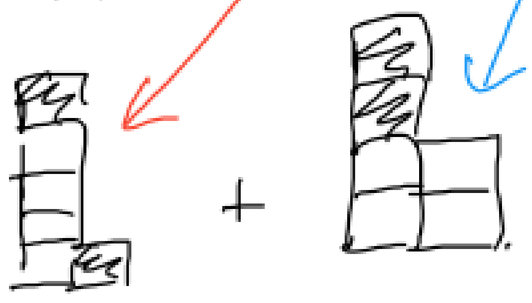
Diagrams represent elts.



$\longleftrightarrow \quad x_1^2 y_1 + x_2^2 y_2$

$\longleftarrow \quad x_1^2 y_2 + x_2^2 y_1$

Product = "match a stack"



Then $\mathbb{F}_2[x_1, x_2, y_1, y_2]^{S_2}$ is gen'd by

a, b, c, d, e, f

$ab = e + f.$

$ef = a^2 d + b^2 c.$

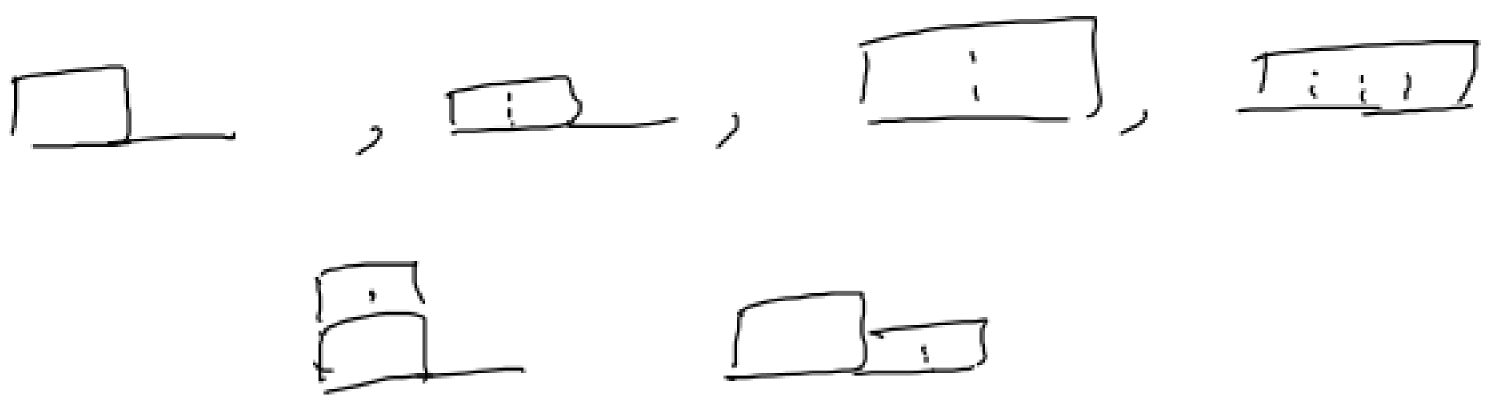
$x, y, \ldots$ set of variables

In general $\bigoplus_n \mathbb{F}_2[x_1, \ldots x_n, y_1 \ldots y_n, \ldots]$

Is a primitively gen'd divided powers $\mathbb{N}$-component Hopf ring gen'd by first symm. poly in each variable.

Relationship to $H^* BS_n$:

In $H^* BS_8$,



which give rise to a subring $\cong$ to the $\mathbb{F}_2[x_1, x_2, y_1, y_2]^{S_2}$.