Smaller Font? Narrower margins?

Cheat Sheet β

http://drorbn.net/AcademicPensieve/2013-03/
initiated 24/3/13; continues 2013-03; modified 8/4/13, 11:26am; completed ?

The original β-calculus: With $\epsilon := 1+\alpha$, $\langle\alpha\rangle := \sum_v \alpha_v$, and $\langle\gamma\rangle := \sum_{v\neq u}\gamma_v$,

$$\begin{array}{c|c}\omega_1 & H_1\\\hline T_1 & A_1\end{array} * \begin{array}{c|c}\omega_2 & H_2\\\hline T_2 & A_2\end{array} =_\beta \begin{array}{c|cc}\omega_1\omega_2 & H_1 & H_2\\\hline T_1 & A_1 & 0\\ T_2 & 0 & A_2\end{array} \qquad \begin{array}{c|c}\omega & H\\\hline u & \alpha\\ v & \beta\\ T & \gamma\end{array} \xrightarrow[\beta]{tm^{uv}_w} \begin{array}{c|c}\omega & H\\\hline w & (\alpha+\beta) \,/\!/\, \left(\begin{smallmatrix}u,v\\ \to w\end{smallmatrix}\right)\\ T & \gamma\end{array} \qquad R^\pm_{ux} =_\beta \begin{array}{c|c}1 & x\\\hline u & t_u^{\pm1}-1\end{array}$$

$$\begin{array}{c|ccc}\omega & x & y & H\\\hline T & \alpha & \beta & \gamma\end{array} \xrightarrow[\beta]{hm^{xy}_z} \begin{array}{c|cc}\omega & z & H\\\hline T & \alpha+\beta+\langle\alpha\rangle\beta & \gamma\end{array} \qquad \begin{array}{c|cc}\omega & x & H\\\hline u & \alpha & \beta\\ T & \gamma & \delta\end{array} \xrightarrow[\beta]{sw^{ux}_{th}} \begin{array}{c|cc}\omega\epsilon & x & H\\\hline u & \alpha(1+\langle\gamma\rangle/\epsilon) & \beta(1+\langle\gamma\rangle/\epsilon)\\ T & \gamma/\epsilon & \delta-\gamma\beta/\epsilon\end{array}$$

Constraints. • Column sums are monomials minus 1.

β-better calculus:

$$\begin{array}{c|c}\omega_1 & H_1\\\hline T_1 & A_1\\ - & \sigma_1\end{array} * \begin{array}{c|c}\omega_2 & H_2\\\hline T_2 & A_2\\ - & \sigma_2\end{array} =_{\beta_b} \begin{array}{c|cc}\omega_1\omega_2 & H_1 & H_2\\\hline T_1 & \omega_2 A_1 & 0\\ T_2 & 0 & \omega_1 A_2\\ - & \sigma_1 & \sigma_2\end{array} \qquad \begin{array}{c|c}\omega & H\\\hline u & \alpha\\ v & \beta\\ T & \gamma\\ - & \sigma\end{array} \xrightarrow[\beta_b]{tm^{uv}_w} \begin{array}{c|c}\omega & H\\\hline w & (\alpha+\beta) \,/\!/\, \left(\begin{smallmatrix}u,v\\ \to w\end{smallmatrix}\right)\\ T & \gamma\\ - & \sigma\end{array} \qquad R^\pm_{ux} =_{\beta_b} \begin{array}{c|c}1 & x\\\hline u & t_u^{\pm1}-1\\ - & t_u^{\pm1}\end{array}$$

$$\begin{array}{c|ccc}\omega & x & y & H\\\hline T & \alpha & \beta & \gamma\\ - & \sigma_x & \sigma_y & \sigma\end{array} \xrightarrow[\beta_b]{hm^{xy}_z} \begin{array}{c|cc}\omega & z & H\\\hline T & \alpha+\sigma_x\beta & \gamma\\ - & \sigma_x\sigma_y & \sigma\end{array} \qquad \begin{array}{c|cc}\omega & x & H\\\hline u & \alpha & \beta\\ T & \gamma & \delta\\ - & \sigma_x & \sigma\end{array} \xrightarrow[\beta_b]{sw^{ux}_{th}} \begin{array}{c|cc}\omega+\alpha & x & H\\\hline u & \sigma_x\alpha & \sigma_x\beta\\ T & \gamma & \delta+\frac{\alpha\delta-\gamma\beta}{\omega} = \frac{\omega+\alpha}{\omega}\delta-\frac{\gamma\beta}{\omega}\end{array}$$

common denominator

missing the σ line

Constraints. • Sum of column x is $(\sigma_x - 1)\omega$ • Likely, $\omega^{k-1} \mid \Lambda^k A$.

From 2012-05/A Higher Minors Experiment:

$$\frac{1}{\omega^2}\begin{vmatrix}(\omega+\alpha)\delta_{11}-\gamma_1\beta_1 & (\omega+\alpha)\delta_{12}-\gamma_1\beta_2\\ (\omega+\alpha)\delta_{21}-\gamma_2\beta_1 & (\omega+\alpha)\delta_{22}-\gamma_2\beta_2\end{vmatrix} =$$

starting A: $\begin{matrix}\alpha & \beta_1 & \beta_2\\ \gamma_1 & \delta_{11} & \delta_{12}\\ \gamma_2 & \delta_{21} & \delta_{22}\end{matrix}$

$$\frac{1}{\omega^2}\left[-\gamma_1(\omega+\alpha)\begin{vmatrix}\beta_1 & \beta_2\\ \delta_{21} & \delta_{22}\end{vmatrix} - \gamma_2(\omega+\alpha)\begin{vmatrix}\delta_{11} & \delta_{12}\\ \beta_1 & \beta_2\end{vmatrix} + (\omega+\alpha)^2\begin{vmatrix}\delta_{11} & \delta_{12}\\ \delta_{21} & \delta_{22}\end{vmatrix}\right]$$

$$= \frac{\omega+\alpha}{\omega^2}\left[\omega\begin{vmatrix}\delta_{11} & \delta_{12}\\ \delta_{21} & \delta_{22}\end{vmatrix} + \begin{vmatrix}\alpha & \beta_1 & \beta_2\\ \gamma_1 & \delta_{11} & \delta_{12}\\ \gamma_2 & \delta_{21} & \delta_{22}\end{vmatrix}\right]$$

divisible by ω; div by ω^2; div by ω^2; div by $\omega+\alpha$.

larger

To do. • Consider a verification program. • Add dm formulas. • Add Burau calculus.

* Add the conjugation relation

Add the MVA Formula:

```
βMVA[L_Link] := Module[{ηs, ω, μ, M},
  {ω, μ} = List @@ βZ[L];
  ηs = Rest[h_# & /@ (First /@ Skeleton[L])];
  M = Outer[
    Coefficient[μ - (μ /. t_ → 1 /. h_a_ :→ t_a h_a), #1 * #2] &,
    ηs, ηs /. h_a_ :→ t_a];
  Factor[ω Det[M] / (1 - T_Skeleton[L][[1,1]])]]
```

$\omega+\alpha$	x	H
u	$\sigma_x\alpha$	$\sigma_x\beta$
T	γ	$\delta + \frac{\alpha\delta-\gamma\beta}{\omega} = \frac{(\omega+\alpha)\delta-\gamma\beta}{\omega}$
$-$	σ_x	σ

Aside: $\alpha+\gamma = \omega(\sigma_x - 1) \Rightarrow$

$(\omega+\alpha)(\sigma_x-1) = \alpha+\gamma+\alpha(\sigma_x-1)$

$= \sigma_x\alpha + \gamma$

$$\gamma = \frac{(\omega+\alpha)\gamma - \gamma\alpha}{\omega}$$

So this is a row operation!

$\omega\epsilon$	x	H
u	$\alpha(1+\langle\gamma\rangle/\epsilon)$	$\beta(1+\langle\gamma\rangle/\epsilon)$
T	γ/ϵ	$\delta - \gamma\beta/\epsilon$

$$\frac{\gamma}{\epsilon} = \frac{\gamma}{1+\alpha} = \gamma - \frac{\gamma\alpha}{\epsilon}$$

W	H
u	α
T	β

$\longmapsto$

$W+\alpha_x$	H
u	$\sigma_x\alpha$
T	β . . .

$\} \sim$