B-Side Operations, II

September-16-11
10:01 AM

C_i's are central, $a_{ij} \Longleftrightarrow t_i h_j$

For heads, $[x, y] = c_x y - c_y x$

(1) $[a_{ij}, a_{ik}] = 0$,

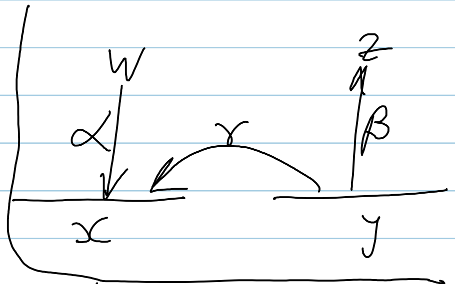
(2) $[a_{ik}, a_{jk}] = c_i a_{jk} - c_j a_{ik}$

(3) $[a_{ij}, a_{jk}] = c_j a_{ij} - c_i a_{jk}$

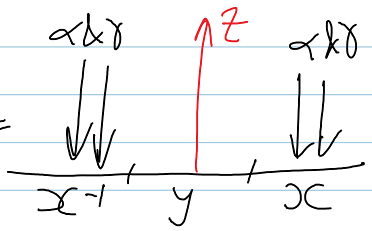
```
         b[ar[1, 2], ar[1, 3]]
In[35]:= b[ar[1, 3], ar[2, 3]]  /. h → c // MatrixForm
         b[ar[1, 2], ar[2, 3]]

Out[35]//MatrixForm=
   0
   ar[2, 3] c[1] - ar[1, 3] c[2]
   -ar[2, 3] c[1] + ar[1, 3] c[2]
```

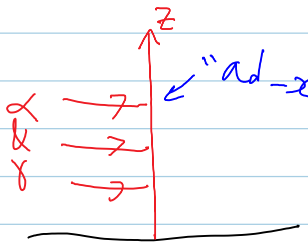
playground Program.nb.

$\mu = \alpha a_{wx} + \beta a_{yz} + \gamma a_{yx}$:



$E_y C_y^x(\mu) = \beta u_1 + \gamma u_2$ with:

$u_1 =$


$=$


$=$

$$e^t = 1 + (e^t - 1) = 1 + t + \frac{e^t - 1 - t}{t^2} t^2$$

by (3) "$ad_{-x}\, y = c_x y - c_y x$", so

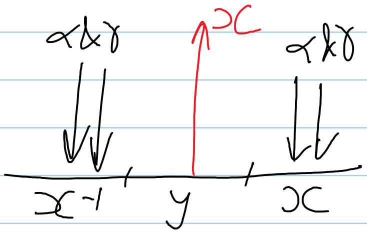
$= e^{-\alpha c_w - \gamma c_y}$


$$- c_y \frac{e^{-\alpha c_w - \gamma c_y} - 1}{-\alpha c_w - \gamma c_y}\left(-\alpha a_{wz} - \gamma u_1\right)$$

signs may be wrong here.

$\Longrightarrow$ by 110916 Calculator.nb:

$$u_1 = \frac{\left(-1 + e^{\alpha c_w + \gamma c_y}\right) \alpha a_{wz} c_y + a_{yz} \left(\alpha c_w + \gamma c_y\right)}{e^{\alpha c_w + \gamma c_y} \alpha c_w + \gamma c_y}$$

$u_2 =$


$$= c_y \cdot \frac{e^{-\alpha c_w - \gamma c_y} - 1}{-\alpha c_w - \gamma c_y} \cdot w + a_{yx}$$

The General Case, by reasonable extrapolation:

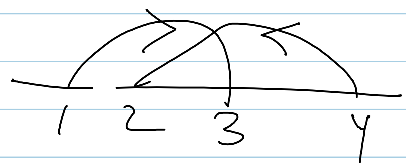
$\mu = \alpha^w a_{wx} + \beta^z a_{yz} + \gamma a_{yx}$ Einstein respected

$E_y C_y^x(\mu) =$ "$\beta u_1 + \gamma u_2$"

$$= \beta^z \frac{(e^{\alpha^w c_w + \gamma c_y} - 1)\alpha^w a_{wz} c_y + a_{yz}(\alpha^w c_w + \gamma c_y)}{e^{\alpha^w c_w + \gamma c_y}\, \alpha^w c_w + \gamma c_y}$$

$$+ \gamma c_y \cdot \frac{e^{-\alpha^w c_w - \gamma c_y} - 1}{-\alpha^w c_w - \gamma c_y} ; W + \gamma a_{yx}$$

Debug the W part first!



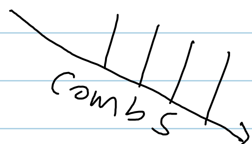
$$gh = ghg^{-1}g$$

$$1234 = 1(23)4 = 1(23)4(23)^{-1}(23) = 14^{-(23)}(23)$$

$$1234\,3^{-1}3 = 124^{-3}3 = 124^{-3}2^{-1}23$$

Aside $a \wedge g := g^{-1}ag$ $a \vee g := gag^{-1}$
$(a \vee g) \vee h = hgag^{-1}h^{-1} = a^{\vee}(hg)$

$$= 1(4^{-3})^{-2}(23)$$

Can I identify the image of  in the above?

[may as well split by the heads]

$$b_{ij} \longmapsto c_i a_j - c_j a_i$$