Dim Lie-w

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9:51 AM

$$\left[\begin{pmatrix} a_1 \dots & a_n \\ & 0 \end{pmatrix}, \begin{pmatrix} b_1 \dots & b_n \\ & 0 \end{pmatrix}\right]$$

$$= \begin{pmatrix} a_1b_1 & a_1b_2 \dots & a_1b_n \\ & 0 & \end{pmatrix} - \begin{pmatrix} & \end{pmatrix}$$

$$= \begin{pmatrix} 0 & a_1b_2 - b_1a_2 & a_1b_3 - b_1a_3 & \dots \\ & & 0 & \end{pmatrix}$$

So if (x_i) is the dual basis to (a_i), we have

$$[x_i, x_j] = \delta_{1i} x_j - \delta_{1j} x_i$$

Seems useless

By Milnor-Moore and given that $\mathcal{A}^w$ is graded, it is enough to show that $\{D_L, D_R\}$ are lin-indep and that for any $i \geq 2$, W_i is non-zero. All this can be done using the $ax+b$ algebra.