# DSGRN Group Meeting Presentation 4

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# Wrote some slow code

I wrote code to find all the total orders that can arise when finding the parameter space decomposition for a linear interaction function given multiple thresholds, but my code is very inefficient.

Luckily, what I've coded so far seems to be slow in general so there are some general improvements to be made.

Additionally, I've noticed that in the multiple thresholds case there is additional structure I have yet to take advantage of.
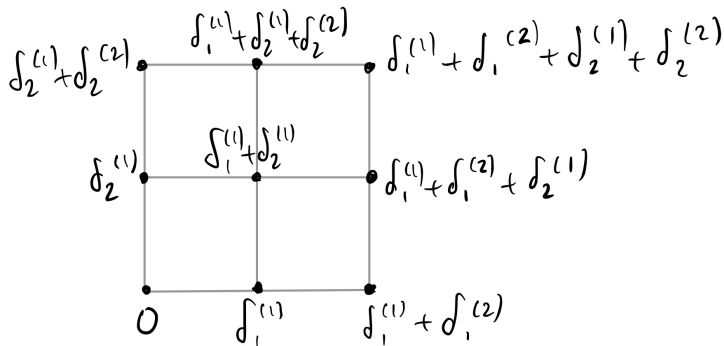
So for my next steps I'll increase the efficiency of my code and to see if I can get some more useful results.

# The one non-trivial calculation so far

$$f = z_1 + z_2$$

$z_1 = \ell_1,\ \ell_1 + \delta_1^{(1)},\ \text{or}\ \ell_1 + \delta_1^{(1)} + \delta_1^{(2)}$

$z_2 = \ell_2,\ \ell_2 + \delta_2^{(1)},\ \text{or}\ \ell_2 + \delta_2^{(1)} + \delta_2^{(2)}$

$\delta_2^{(1)} + \delta_2^{(2)}$    $\delta_1^{(1)} + \delta_2^{(1)} + \delta_2^{(2)}$    $\delta_1^{(1)} + \delta_1^{(2)} + \delta_2^{(1)} + \delta_2^{(2)}$

$\delta_2^{(1)}$    $\delta_1^{(1)} + \delta_2^{(1)}$    $\delta_1^{(1)} + \delta_1^{(2)} + \delta_2^{(1)}$

$O$    $\delta_1^{(1)}$    $\delta_1^{(1)} + \delta_1^{(2)}$

So far I've calculated that there are 36 total orders in this case (modulo some optimization errors)