**My solution for the Second Assignment:**

**Description:**

*Grid Structure:*

We will need a ***3D Grid*** with ***64 threads*** arranged in ***2 bocks*** ***in X-dim***, ***2 blocks in Y-dim***, and ***2 blocks in Z-dim,*** with each having ***2 threads in X-dim,*** ***2 threads in Y-dim,*** and ***2 threads in Z-dim.***

Chart

Description automatically generatedSo:

1. We will need to change the tid formula to get the following:

tid = threadIdx.y\*blockDim.x + threadIdx.x + threadIdx.z \* blockDim.y \* blockDim.x

For the sake of simplicity, we only need to add threadIdx.z times the dimensions of both y and x (in this case, we do this to accomplish the following):



1. Then, we will need to add another variable to the global\_index formula

**Recall:**

global\_index = row\_offset + block\_offset + tid

row\_offset = Up to Down **|** block\_offset = Left to Right

tid = Internal thread indexes in each block

And now, I propose adding **depth\_offset** (z-dim). It will need to activate using values that are bound to **blockIdx.z**

**num\_threads\_in\_a\_depth = gridDim.z** \* **num\_threads\_in\_a\_row**

**depth\_offset** = **blockIdx.z** \* (**gridDim.z** \* **num\_threads\_in\_a\_depth**)

**So at the end, we get the following formula:**

global\_index = row\_offset + block\_offset + depth\_offset + tid

We do the following to accomplish the following structure:



Data initialization:

A 64-element array (assuming int array) and we will pass the array to the device. We will follow the previous examples for this part.