Questions to ask Bilal

Do the ‘Y’ and ‘Z’ coordinates have to be altered too like the ‘X’ experimental coordinates

What I need to do:

1. Reduce the frequency in numerical data

Numerical mode shape has to be reduced from:

25 x 6 x 348

To

11 x 3 x 36

Prior Step:

Add the numerical + displacement value for the numerical cell data

Three Steps:

25 🡪 11 by the frequencies cut

6 🡪 3 by getting rid of the 3 rotational modes? Or

348 🡪 36 (348 represents the separate grid points) We reduce this to 36 by comparing the experimental grid points prior and reducing it to 36 gridpoints after comparing experimental and numerical data.

This matrix must be changed to 348 x 25 x 6 for verification :// 348 sheets of 25 frequencies x 6 modes of acceleration

**Matrix Reduction in Python**

Delete axis using np.delete (numpy library)

np.delete(array, object, axis)

object (starting index from 0) is the index of the axis you want to delete

axis definition:

for 2 x 2 matrix

axis = 0 is equal to rows

axis = 1 is equal to column

-extrapolating on this idea, I presume axis = 2 would be used for a 3dimensional array

**Frequency Reduction**

Frequency is sorted from least to greatest (with the exception of the first three points)

* Initial Search could either be guess and check or bisection search (the latter saves time)
* I could try to use a percentage of 10% and then include an if statement or while loop stating that if it is an even further smaller error continue on
* The most important thing is that the tolerance varies based on from number to number

It might be easier to just search by guess and check and save the previous entry to continue the search for the next index

Function

Num\_freq = num\_data[‘freq\_NASTRAN\_out’][

Exp\_freq =

While

**Reducing based on Grids**

Mode -> var used to cycle through the rows of

#Problem Line 79

* Grids\_uni\_le\_te has the index of the grid points index that we deem appropriate, not the actual grid points, so all values are being caught in the deletion file, resulting in a indexing error.
* I need to either :

1. Make a new matrix with all of the proper grid points, given the indexes

-OR-

1. Use the index to reference the correct grid points (like I would do in Matlab)
   1. if node is not in Grids\_uni\_le\_te

create temp array of next

**Methods for sifting through frequencies and gridpoints**

Possible Order of Frequencies:

* Assumptions: Frequencies are generally in increasing order (except for the first 3)
* No duplicate frequencies
* Every experimental frequency has a numerical counterpart
* Because of the experiment in question, we will assume that the greatest experimental frequency << the greatest numerical frequency

Possible order of frequencies in row vector

S = Small Margin of error, SS = Even smaller margin of error, E = The Ideal smallest numerical frequency, G = large margin of error (all of these are relative to experimental value E\_real)

Possible Orders:

Version 1:

G S SS E SS S G

Version 2:

G S E G G G G

G S E G G G G

Boundary Cases:

Version B1:

G S SS(makeshift E) End