Part 1:

In this part, I first tried to read the file, splitting the outputted read file after each line. After this, I calculate the determinate so that I have the tools I need to decide whether or not the system is inconsistent or undetermined. After this, I immediately check to see whether the system can be solved or if it is undetermined/inconsistent by checking the value of the determinant. If the determinant is 0, the first group of nested if statements are executed. Otherwise, the inverse of the read matrix is calculated using the shortcut method, and the inverse is then used to calculate the solution.

Part 2:

In this part, I again first read the file, splitting the output using a for loop, and I convert the numbers to a float to make things easier later. I then compute the determinant and tracing to use with lambda in my calculations. Once I calculate the eigenvectors, I found it was quite easy to normalize them, but I thought that was going to be the hard part. After that, I begin plugging in the previously calculated matrices to find the composition, and then I print them. Of course, there is an outer loop to all of these calculations, as they will only happen if the discriminant is greater than or equal to 0. If it is not, then the program ends with printing out that there are no eigenvalues.

Part 3:

In this part, I first open the file for reading, but strip the first line so that I can get the length and cords of the first point. I read the file into a matrix, and then pass this matrix to the first if else statement. This part basically checks to see if the matrix is 2D or 3D. I feel like there was a better way to do this, but I cannot figure it out. The first if statement gets the cords of the first point, while the second computes the distance between the third point and the line formed from the first 2 points. After this, the output is printed.

While the first 2 codes are working just fine, and they print out the correct values (tested with the input files), the third part is something I cannot get working. I am not sure where I am going wrong, but I feel like I am not reading the file right. I keep going out of bounds, and so I feel like its something to do with me reading the files. Not completely sure, but I am proud of the first two parts, and I feel like I am close on the third, just missing something.