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Question 3
CMSC_409
Final Exam

I first set up my own values to manually design a controller.
I created a fuzzy table by looking at the contour map and guessing ranges for all values.
I created a map of all singleton Letters by manually assigning them based on the contour map
I manually assigned singleton values based off the mesh plot on the question.
A = 0.6, B = 0.5, C = 0.4, D = 0.2, E = 0.1, and I created a G = 0.0 just in case no values were input

The design process was to take a (X,Y) value and pass it into a function called fuzzy value
That class would send it to another class called fuzzifier to split the x and y into 4 coordinates with 4 values associated with each point. Those points were the distance from the center of each triangle that was manually entered before.

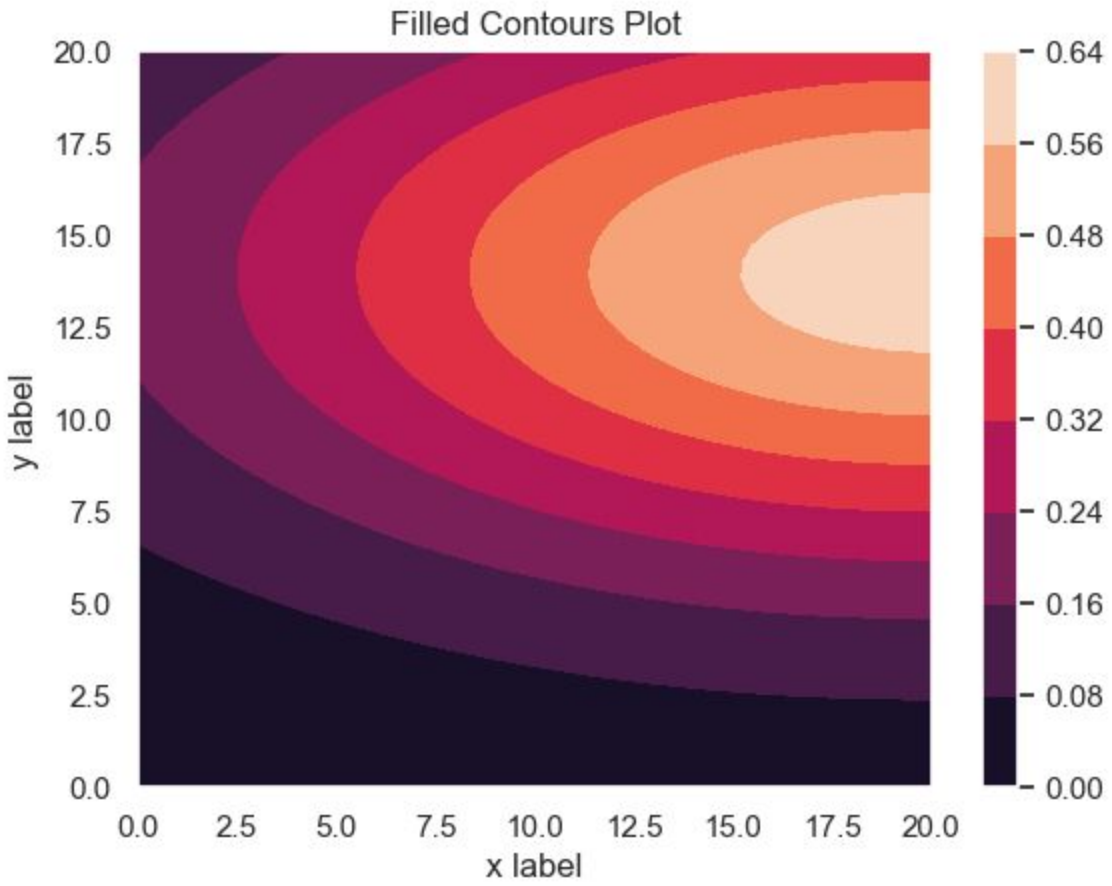
These 4 coordinates along with these 4 min values are put into a new function fuzzy_table
This function compute the row and column of those values and return a singleton Letter from that value.

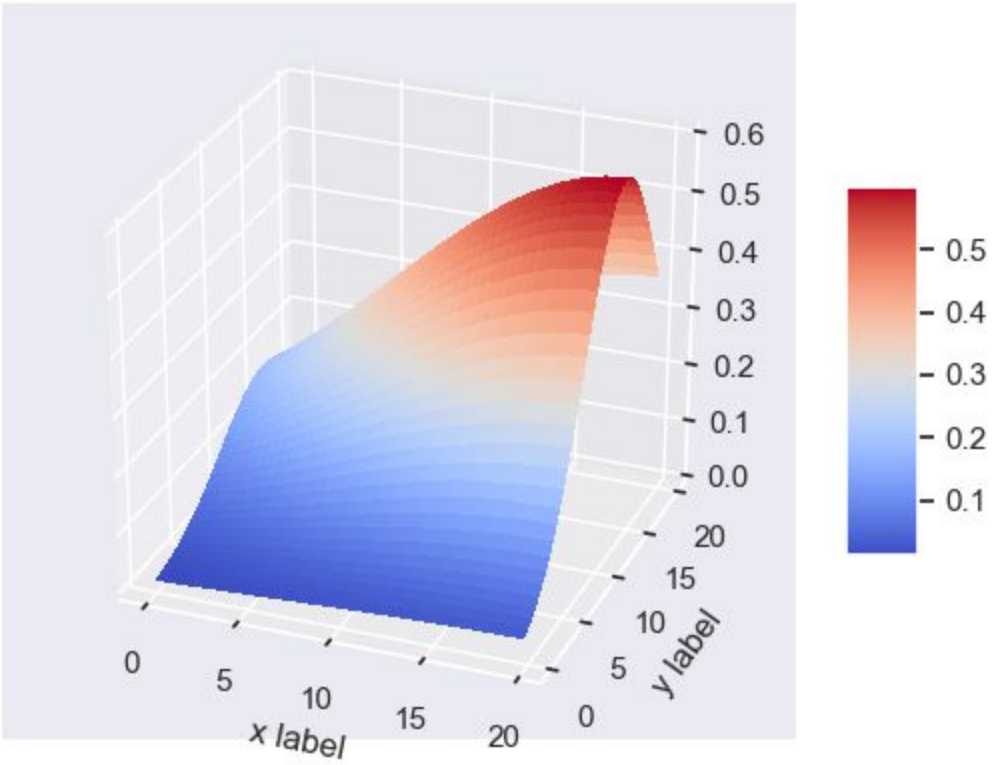
From there the 4 singleton letters and the min values are sent to a new function max_singleton that computers the max value from those 4 min for each letter specifically and return the two max values along with the two singleton letters

The 2 singleton letters and their associated max values are sent to a defuzzy_output function which computes the output from those values using the function output = max * (singleton letter value) + max2 * (singleton Letter value) all that divided by the sum of the two max letters.

This letter is returned as a Z value.

I plot the original figures based off the equation


Filled Contours Plot
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
y label
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
x label
0.64
0.56
0.48
0.40
0.32
0.24
0.16
0.08
0.00



My plots were not able to print I did not figure out how to print them in time.