Engr421 HW1 Report

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Part 2:

I created random data points with the given parameters, with the approach given in textbook and the class notes. I also used lab material to populate these data points. In this part, I directly followed the class material that was instructed.

The difference from the lab is that I used the multivariate_normal function since this scheme is a multivariate structure.

My results were matching the desired format and regarding my calculations, the results were correct.

Part 3: Estimating the parameters

Again I directly followed the class materials that was instructed in the labs and class notes. Since the scheme is multivariate, getting sample_covariances was different from the lab material. The other parts, class_priors and sample_means were pretty much the same. I used the direct class notes to find all means, covariances and priors. Thus, my code is directly an implementation of the class notes.

My results were matching the desired format and regarding my calculations, the results were correct.

Part 4:

To find the confusion matrix, I used lab 3 material. I used the pandas module to display the differences between y_predicted and y_truth.

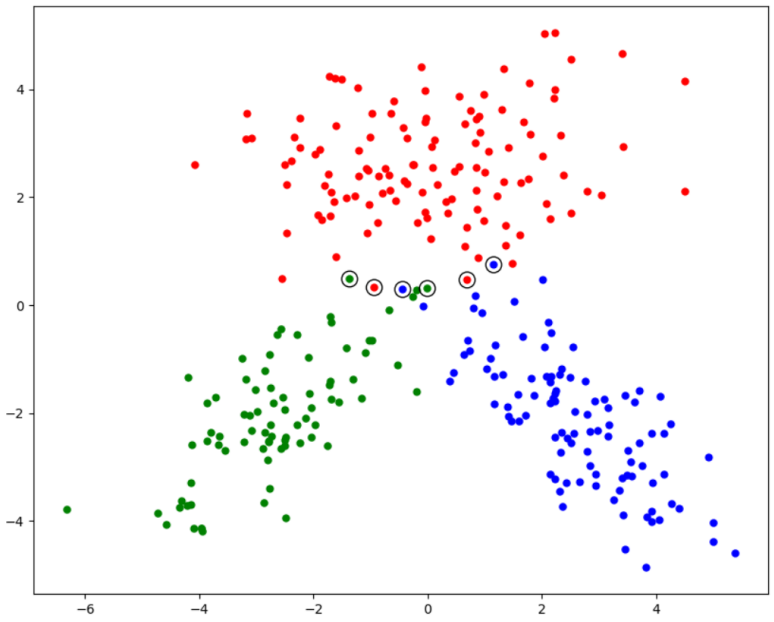
My results were matching the desired format and regarding my calculations, the results were correct.

Part 5:

Once again, I followed the class notes and lab material to create a visual representation of the decision boundaries. The result was indicating the mis-predictions by drawing a slightly bigger circle around the data points. The ML estimations were %95-96 correct with only 6 data points mis-predicted on the intersections regions that the ML program thought the decision boundaries were cut on that edge.

In this part, I could not draw the lines that separate the clusters. Except that, my result was matching the desired format.

My latest output is shown in the visual below, which displays pretty much the same structure as desired, with the little exception of separation of the clusters.



Overall, I think the project was pretty on point, to make me comprehend the class and lab materials. I found this project pretty valuable and learned a lot from it. I think my performance on the whole of the project was sufficient and I really comprehended the basics and did the most of the parts using the class notes.

Acknowledgements:
I have never taken or given a code, or a snippet of code to/from anyone. Thus, all the work completely belongs to me. I have only used the class material, class notes, lab material and course textbook while doing this project.