ENGR 421 Homework 1

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Text

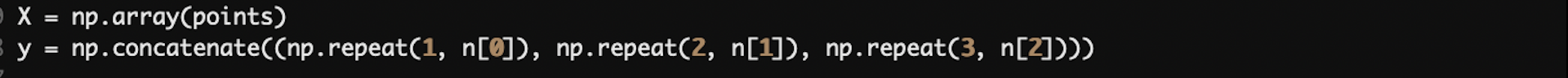
Description automatically generated

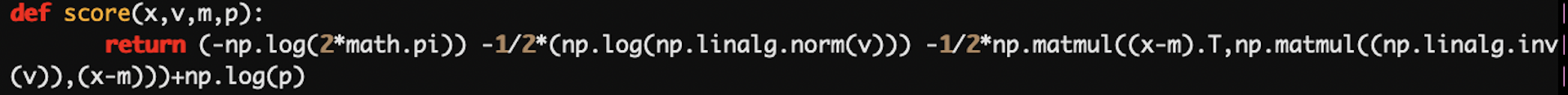
In the first part of the code I imported the required libraries and created data structure that will be needed in the rest of the project. I also implemented the given data.

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Here I used a numpy function np.random.multivariate\_normal() in a for loop to create our random data points for every single given mean and covariance. I also calculated the mean and covariance of our sample data points which are created by the np.random.multivariate\_normal() function.



I created the y array , it contains 1’s , 2’s and 3’s respectively for every red, green and blue data points.

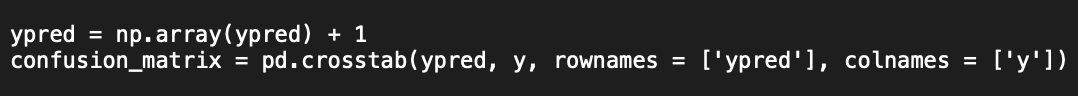
Text, whiteboard

Description automatically generatedHere I defined the score function according to the equation given in class. I will use this function for prediction.

Graphical user interface

Description automatically generated

In this for loop I checked every dot using the previous score function for 3 different parameters and save the maximum scores class (0 for red, 1 for green, 2 for blue) in a list called ypred.



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Description automatically generatedHere I added 1 to ypred to make sure that in y array and ypred array the classes are represented with the same numbers (1’s for red, 2’s for green and 3’s for blue). Then using a function from pandas library I created the confusion matrix and printed the outputs. Gives the output below.

I used the same loop I used for creating ypred on a matrices xx, yy. I used plot(), countour(), countourf() functions from matplotlib library to get the output below.

Chart

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