Intro2MachineLearningHW06

In this homework, we implemented 2 clustering algorithms. K-means algorithm and Expectation-Maximization algorithm. As it is said in the description pdf, 2 iteration with the K-Means and 100 iteration with the EM. The K-means algorithm was almost the same as the lab session. Except I had to put the functions in a for loop so that I can do it for the iteration limit. In the lab the iterations were manual. When it comes to the EM, unlike the K-means algorithm, I had to find the most likelihood gaussian density. The gaussian density was the same as in the Multivariate Methods. The steps were the same as in the K-means algorithm, in the E-step I calculated the maximum likelihood of the hidden variable and in the M-step I updated the centroids with the means of the assignments of the variables. I repeated the steps for 100 times and end up with the output of 5 means of the 5 clusters. After the iterations I plot and colored the data points. Then I draw contours of the real and predicted density distributions

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            [,1]         [,2]
[1,]  -2.6759195   2.44658903
[2,]   2.4887435   2.67687075
[3,]   2.6622246  -2.30911079
[4,]  -2.0441920  -2.69776844
[5,]   0.1553518   0.05773828
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