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4. Comparing K-means and EM

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Project due Apr 26, 2023 08:59 -03 Completed

Generate analogous plots to K-means using your EM implementation. Note that the EM algorithm can get stuck in a locally optimal solution. For each value of K , please run the EM algorithm with multiple seeds and select the solution that achieves the highest log-likelihood. Compare the K-means and EM solutions for $K = [1, 2, 3, 4]$. Ask yourself when, how, and why they differ.

Reporting log likelihood values

1.0/1.0 point (graded)

Report the maximum likelihood for each K using seeds 0, 1, 2, 3, 4:

Log-likelihood $_{K=1}$ = ✓

Log-likelihood $_{K=2}$ = ✓

Log-likelihood $_{K=3}$ = ✓

Log-likelihood $_{K=4}$ = ✓

Submit

You have used 2 of 50 attempts

Analysing plots

1.0/1.0 point (graded)

Which of the following sentences are true? (Check all that apply)

Note: This question is the multichoice version of the free-text question: "Compare the K-means and EM solutions for $K = [1, 2, 3, 4]$. Ask yourself when, how, and why they differ."

In order to answer this, you should look at the plots side by side, either by adapting the plots to be shown together or by simply saving the plots as you go. For each value of K , ask yourself when the solutions are similar or different. If they are different, why are they different?

Hint: What are we optimizing for in each case? What are we plotting? In the case of K-means, with EM, can these really be called clusters? What is EM optimizing for?

Now, write a descriptive paragraph of your observations as if it were part of a report for which you were going to hand this back for us to grade. Try matching your paragraph with the options. If it doesn't match, then we wouldn't have given you full credit for this question.

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