

<u>Unit 4 Unsupervised Learning (2</u>

Project 4: Collaborative Filtering via

Course > weeks)

> Gaussian Mixtures

> 4. Comparing K-means and EM

## 4. Comparing K-means and EM

Generate analogous plots to K-means using your EM implementation. Note that the EM algorithm can also get stuck in a locally optimal solution. For each value of K, please run the EM algorithm with seeds 0,1,2,3,4 and select the solution that achieves the highest log-likelihood. Compare the K-means and mixture solutions for K=[1,2,3,4]. Ask yourself when, how, and why they differ.

## Reporting log likelihood values

1/1 point (graded)

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

$$\text{Log-likelihood}|_{K=1} = \boxed{-1307.2234317600937}$$

$$\text{Log-likelihood}|_{K=2} = -1175.7146293666792$$

$$\text{Log-likelihood}|_{K=3} =$$
 -1138.8908996872672

 $\text{Log-likelihood}|_{K=4} =$  -1138.6011756994853

Submit

You have used 1 of 20 attempts

✓ Correct (1/1 point)

## Analysing plots

1/1 point (graded)

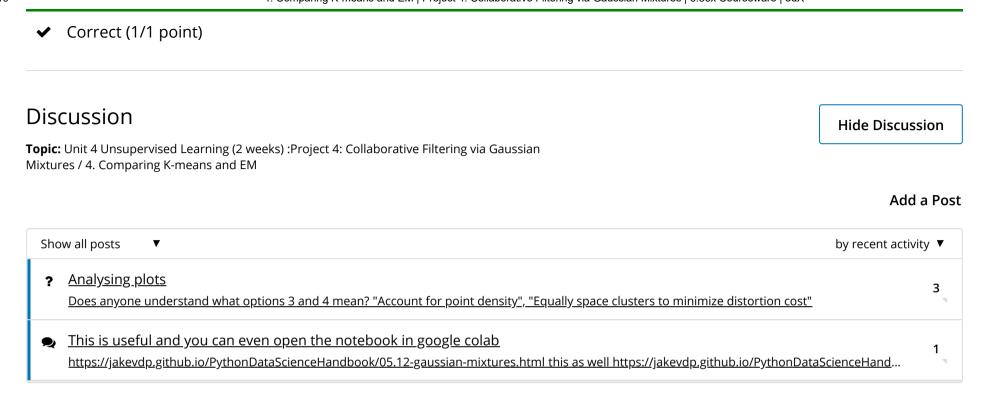
Which of the following sentences are true? (Check all that apply)

- ✓ In the case K=1, the mixture parameters and point assignments are the same for both methods
- ✓ In the case K=2, both methods have simlilar parameters and point assignments
- In the case K=3, the k-means solution accounts for point density better than EM
- ☑ In the case K=4, the k-means solution equally spaces the clusters to minimize distortion cost



Submit

You have used 1 of 3 attempts



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