Started on	Sunday, 28 July 2024, 11:25 PM
State	Finished
Completed on	Sunday, 28 July 2024, 11:37 PM
Time taken	11 mins 22 secs
Marks	15/15
Grade	**10** out of 10 (**100**%)

Question 1

Correct

Mark 1 out of 1

Which of the following statements are true?

- [ ] 1. Gaussian mixture models and k-means assume that clusters are spherically shaped.
- [x] 2. MANOVA is an extension of ANOVA taking into account feature correlations.
- [ ] 3. k-means++ is a centroid-based clustering approach.
- [x] 4. For non-concentric clusters DBSCAN is preferrable over Gaussian Mixture Models.
- [ ] 5. Pairwise cluster comparisons are an alternative to ANOVA, as long as the Type I error is chosen high enough.
- [ ] 6. DBSCAN and k-means both require some seeds, i.e., starting points, as input.
- [x] 7. DBSCAN is a density-based clustering algorithm.
- [ ] 8. ANOVA as a clustering quality measure tests whether all found clusters are unequal.
- [x] 9. k-means and Gaussian mixture models both require the number of clusters as input.

Your answer is correct.

Correct

Marks for this submission: 1/1.

Question 2

Correct

Mark 5 out of 5

For the given problems, of the method pool DBSCAN, k-means, Gaussian mixture model (GMM) fill in the method that best suits the purpose.

- DBSCAN : Input data points are no real values, but still give rise to distance measures.
- k-means : Approximately equally sized clusters are needed.
- GMM : There might be a correlation between the input variables, and my data is quite noisy possibly leading to an overlap of my clusters.
- DBSCAN : It must be expected that clusters are submanifolds with a complex structure.
- k-means : A simple representation of the found clusters is needed; if possible, one should simply be able to draw a Voronoi diagram.

DBSCAN | GMM | k-means

Your answer is correct.

Correct

Marks for this submission: 5/5.

Question 3

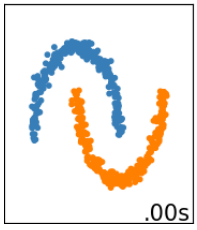
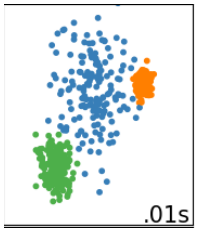
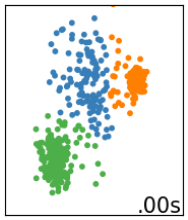
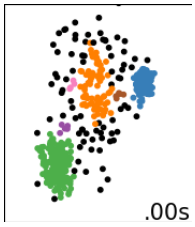
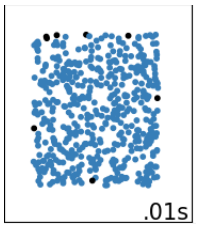
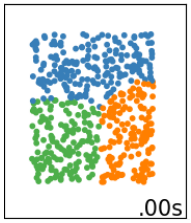
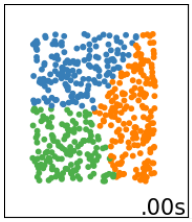
Correct

Mark 9 out of 9

It is helpful to develop a gut feeling, which shapes of data a clustering method can handle well, and what is the expected outcome for a given shape.
Thus, we here have a glimpse on the opposite task: Given a clustering result, deduce which of the three methods we looked at this could have been, using the properties of the methods as differentiating factors. (Each method can only occur once in a row.)

Some hints that might be helpful:

- *DBSCAN explicitly marks outliers, marked separately as noise. The other two techniques will assign also outliers to some cluster.*
- *k-means creates clusters of approximately spherical shape and equal size, while GMMs allow also elliptical and non-equally sized clusters.*
- *DBSCAN may incorrectly connect overlapping clusters or fail to connect clusters if the density is too high/low in the separating regions, leading to spuriously large/small artifact clusters.*
- *DBSCAN cannot deal with (strongly) varying density of clusters.*

Image	=Method	Image	=Method	Image	=Method
	= k-means				
	= DBSCAN		= GMM		
	= GMM		= k-means		= DBSCAN
	= DBSCAN		= 3-class GMM		= 3-class k-means

Correct

Marks for this submission: 9/9.

◄ 09. Quiz - Decision Trees and Ensembling

Jump to...

11. Quiz - Dimensionality Reduction ►