Self study of clustering algorithms for extra credit (0.5 pts toward the semester overall grades)
(This is an individual assignment, not team assignment)

Due date: April 26 at 11:59pm
Goal: to understand what clustering algorithms can do and how to solve clustering problems.
Required work:

1) Identify reliable literature (book chapters, review papers, classic papers on the subject…) and learn about clustering algorithms.
2) Focus on studying 2 clustering algorithms of your own choice.
3) Use a very small/artificial dataset (you can create them or use open source dataset) to demonstrate how your two clustering algorithms work.
4) Provide a comparison between the two algorithms you identified both qualitatively (e.g., different distance measures result in different clustering outcomes, difference in regularization to determine the number of clusters, etc.) and quantitatively (e.g., plots showing final clustering results, learning curves, etc.).

Report:

- A 2-page report in IEEE publication format (including references you identified and used) to fully discuss the algorithms of your choice and results. Details are expected to the extent so that your readers understand the basic working principle of your algorithms and how it is applied to solve the given problem. If your readers have similar problems in mind, they will be able to use your report as a guideline to approach their solutions.
- Suggested sections of the report: description of the clustering algorithms with necessary mathematical equations and variables defined, and thus show how they work, how data was prepared and how the algorithms can be applied with implementation details (such as hyperparameters/model selection, initialization, stopping criteria…), how to evaluate performance (if comparisons are made in the paper, the results should be included), and references cited (including where and how the dataset is obtained. If you use open source code, clearly provide a reference to that). If you are going to generate your own dataset, describe how it is done.
- Upload a single pdf file (file name convention: Team#_LastName_keywords) to include all files for submission.