Unsupervised machine learning projects

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3 projects involving all methods seen in UML

First project: PCA and FA
Second project: Whitening and ICA
Third project: Clustering and Nonlinear dimensional reduction

Submissions consist in:
1) Codes with implementations
2) Executable script with calculations and figures
3) Written report

Pass => >50 points in each project. Progress counts!

Delay => Penalty of 10 points per day.
First project: Principal component analysis and factor analysis

1) Basics of PCA
2) Basics of FA
3) Application to compression and denoising
Second project: Whitening and ICA

1) Basics of ICA
2) ICA using Kurtosis
3) ICA using Maximum Likelihood
4) Application to natural image separation
Third project: Clustering and Nonlinear dimensional reduction

1) K means and Gaussian mixtures
2) Self-organizing maps
3) Isomap, Kernel-PCA, Laplacian eigenmaps, neighbourhoods