Machine Learning Exercises - V

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Exercise 8

Generate 4-dimensional data and demonstrate the usage of Uniform Manifold Approximation and Projection (UMAP) in dimensionality reduction to a 2-dimensional representation. Study the four main hyperparameters by plotting the graph and document their impact.

Exercise 9

Showcase the usage of UMAP as a feature extraction technique for classification problems. Use the LinearSVC model to distinguish the performance pre and post-adaption of UMAP for feature extraction. You're expected to perform pipeline operations by integrating UMAP for hyperparameter tuning.

Note: The above exercises are adapted from UMAP documentation. Use the Scikit-learn dataset to generate classification data (toy dataset) and GridSearchCV for hyperparameter tuning.

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