

# SPLEX TME 7

## Some Other Methods of Supervised Classification

The goal of the TME is to acquire practical skills in linear and quadratic discriminant analysis, nearest neighbour classification method, and AdaBoost.

**Data** (three simulated data sets + one real)

- Simulated data
- Diabetic Retinopathy Debrecen Data Set  
<http://archive.ics.uci.edu/ml/datasets/Diabetic+Retinopathy+Debrecen+Data+Set>

### Libraries

You will need to load the following packages:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from sklearn.datasets import make_classification
from sklearn.datasets import make_blobs
from sklearn.datasets import make_moons
from sklearn.discriminant_analysis import LinearDiscriminantAnalysis
from sklearn.discriminant_analysis import QuadraticDiscriminantAnalysis
from sklearn import neighbors
from sklearn.ensemble import AdaBoostClassifier
```

### Analysis

Compare the following supervised learning methods in terms of accuracy (10-fold cross validation) on the data sets mentioned above.

1. Linear discriminant analysis  
[http://scikit-learn.org/stable/auto\\_examples/classification/plot\\_lda\\_qda.html#sphx-glr-auto-examples-classification-plot-lda-qda-py](http://scikit-learn.org/stable/auto_examples/classification/plot_lda_qda.html#sphx-glr-auto-examples-classification-plot-lda-qda-py)
2. Quadratic discriminant analysis
3. Classification with Nearest Neighbours  
[http://scikit-learn.org/stable/auto\\_examples/neighbors/plot\\_classification.html](http://scikit-learn.org/stable/auto_examples/neighbors/plot_classification.html)
4. Two-class AdaBoost  
[http://scikit-learn.org/stable/auto\\_examples/ensemble/plot\\_adaboost\\_twoclass.html](http://scikit-learn.org/stable/auto_examples/ensemble/plot_adaboost_twoclass.html)
5. Answer the following questions
  - What methods are linear and what approaches are non-linear?
  - What method(s) appeared to be the most performant?
  - What approach is the easiest to apply?
  - For each method, provide at least one disadvantage
  - For each method, provide at least one advantage