Methods

#### Topics

1. Kernel regression
2. Multiclass classification
3. One-class classification
4. Multi-Label Classification
5. Ensemble Learning
6. Boosting and Bagging
7. Random Forest
8. Gradient Boosting
9. Learning to Label Sequences
10. Sequence-to-Sequence Learning
11. Active Learning
12. Semi-Supervised Learning
13. One-Shot Learning
14. Zero-Shot Learning

# 1. Multiclass Classification

For multiclass classification problems, we extend the logistic regression to **softmax regression algorithm.** This is done by replacing sigmoid function in logistic regression with softmax function.

The loss function in softmax regression is typically the cross-entropy loss (also known as log-loss). Given a set of training examples, the cross-entropy loss measures the dissimilarity between the predicted probabilities and the true class labels.

- log a1, if y == 1

- log a2, if y == 2

L = :

:

- log an, if y == n

Where aj = ezj / ΣNk=1 = P(y = j | x) , where N is the number of classes