Machine Learning Project 1

Groupe: Mohammed NECHBA, Yassine SEDJARI, Mohamed MOUHAJIR

2st year Artificial Intelligence Engineering student at ENSIAS Rabat (Morocco)

Prof. Abdellatif EL AFIA

Results Comparison

After training all our models (Perceptron, Adaline, Logistic Regression Pocket Polynomial with Pocket and Polynomial with Adaline) on 3 different datasets (linearly separable, non-linearly separable and noisy) using three different multiclass classification methods (One vs All, One vs One, Dense Random Coding & Hamming Decoding) we summarised all the results in terms of Accuracy in the table below:

Learning Algorithm	Multiclass Classification Methods								
	One vs All			One vs One			Dense Random Coding & Hamming decoding		
	Linearly Separable Data	Noisy Data	Non-Linearly Separable Data	Linearly Separable Data	Noisy Data	Non-Linearly Separable Data	Linearly Separable Data	Noisy Data	Non-Linearly Separable Data
Perceptron	100	0	0	100	0	0	100	0	0
Adaline	100	92	0	100	92	0	100	92	0
Logistic Regression	100	92	35	100	92	**40**	100	92	35
Pocket	100	92	0	100	92	0	100	92	0
Polynomial Transformation with Pocket	100	92	45	100	92	**49**	100	92	34
Polynomial Transformation with Adaline	100	92	35	100	92	**36**	100	92	34

So, as we can see in the table, when dealing with linearly separable or noisy data all three approaches namely, One vs One , One vs All and Dense Random Coding & Hamming decoding are the same in terms of accuracy. However when dealing with Non-linearly Separable data things gets interesting, The three approaches perform the same on Perceptron, Adaline and Pocket but on Logistic Regression, Polynomial Transformation with Pocket and with Adaline The OnevsOne approach takes the lead with a modest accuracy score of 40, 49 and 36 respectively.