Machine Learning
Exercise Sheet 4

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November 17th, 2014
Submission until November 24th, 13.00 to wistuba@ismll.de

Exercise 7: Variable Selection (5 Points)

a) What is the main difference between Akaike Information Criterion (AIC) and Bayes Information Criterion (BIC)?

b) Apply a forward and backward for the linear regression model for one step only. Which variables are added or removed? To fit the linear regression model you can use the tool of your choice (e.g. R using the command lm()). The error measure is the RSS.
The data is already split into train and validation:

$\mathcal{D}^{train}$

x_1	x_2	x_3	y
4	7	-7	18
-7	9	-6	5
2	-2	-2	6
-4	10	-2	0

$\mathcal{D}^{valid}$

x_1	x_2	x_3	y
-5	9	-5	5

Exercise 8: Shooting Algorithm (5 Points)

Learn the L1-regularized Linear Regression with the Shooting Algorithm for the following dataset with $\hat{\beta}^{(0)} = 0$, $\lambda = 0.1$ and $i_{max} = 1$.

x_1	x_2	x_3	y
3.7	3.8	3.9	4
2.4	2.5	2.3	2
2.2	3.0	4.1	5
3.2	3.1	2.9	3