Introduction to Machine Learning using R: Program

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1 Program overview

The course times are officially from 9am to 5pm on the first day and from 9am until 4:30pm on the second day. This includes two coffee breaks and a lunch break each day.

Table 1: R course day 1

Lesson #	Time	Program
Intro part 1	09:00 - 09:20	**Welcome to workshop** - Welcome - Who am I, who are you? - Organisation of course
Intro part 2	09:20 - 09:40	**Introduction to machine learning** - What is ML? - Difference to statistics - Outlook to the methods used in course
Lesson 1	09:40 - 10:30	**Multivariate data and PCA** - What are multivariate data? - PCA and its application in R
Coffee break 1	10:30 - 10:45	
Exercise 1	10:45 - 11:30	**Multivariate data and PCA** - Manipulate data in R - Apply and interpret PCA
Lesson 2	11:30 - 12:15	**K-Means** - Unsupervised ML - Clustering - K-means working principle - K-means in R
Lunch break	12:15 - 13:15	
Exercise 2	13:15 - 14:00	**K-Means** - Apply K-means in R
Lesson 3	14:00 - 14:45	**K-Nearest Neighbor** - Supervised ML - KNN working principle - Over vs. underfitting - KNN in R

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Lesson #	Time	Program
Coffee break 2	14:45 - 15:00	
Exercise 3	15:00 - 15:45	**K-Nearest Neighbor** - Apply KNN to data and interpret results - Predict values for new observations
Lesson 4	15:45 - 16:15	**Crossvalidation** - Working principle - Application in R
Exercise 4	16:15 - end	**Crossvalidation** - Run CV in R

Table 2: R course day 2

Lesson #	Time	Program
Lesson 5	09:00 - 10:00	**Decision Trees** - Recap previous day - Working principle - Recursive partitioning - Classification and Regression - Application in R
Exercise 5	10:00 - 10:45	**Decision Trees** - Apply decision trees to data
Coffee break 1	10:45 - 11:00	
Lesson 6	11:00 - 12:00	**Random Forests** - Working principle - OOB - Interpretability in ML - Variable importance - Partial dependency plots
Lunch	12:00 - 13:00	
Exercise 6	13:00 - 13:45	**Random Forests** - Apply random forests - Apply interpretation methods
Lesson 7	13:45 - 14:45	**Neural Networks** - Working principle - Application in R
Coffee break 2	14:45 - 15:00	
Exercise 6	15:00 - 16:00	**Neural Networks** - Apply neural networks

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Lesson #	Time	Program
End	16:00 - end	- Workshop wrap up - Feedback