

Introduction into Machine Learning with Python

Day	Topics
DAY1	Python Language 1. The Python Philosophy 2. Using the IPython shell and "Python notebook" 3. Fundamentals 4. Conditional Statements 5. Loops 6. Data Structures: Lists, Tuples, Dictionaries, Sets 7. Functions, recursive functions, decorators 8. File Handling 9. Modules and Packages: Using and Creating 10. Object-Oriented Programming (OOP) with Python
DAY2	Data analysis, visualization and presentation 11. Numpy 11.1. Data Structures 11.2. Ufuncs 11.3. Slicing 11.4. Changing Dimensions and Shapes 11.5. Broadcasting 11.6. Various Mathematical Functionalities 12. Matplotlib 12.1. Plotting Data 12.2. Linestyles and Colors 12.3. Axis and Spines 12.4. Manipulating Tick Label 12.5. Subplots 12.6. Contour Plots 13. Pandas 13.1. Series 13.2. Series to DataFrames 13.3. Series, DataFrames vs. Dictionaries 13.4. Working with DataFrames 13.5. Reading and Writing csv and dsv files 13.6. Working with Excel Files in Pandas 13.7. Hierarchical Indexin 13.8. Working with „incomplete“ data, NaN

DAY3

Machine Learning

14. Basic ideas of Machine Learning and difference between Artificial Intelligence and Machine Learning.
15. Introduction into the module sklearn
16. Synthetic data set generation
17. k-nearest Neighbor Classifier from scratch in Python
18. kNN with sklearn
19. Exercises with Iris and wine data sets and self generated data sets
20. Neural Networks from scratch in Python including mathematical background
21. Neural Networks with sklearn
22. Exercises
23. Introduction into Naive Bayes Classifier
24. Naive Bayes Classifier with sklearn
25. Introduction into Text Classification using Naive Bayes

Requirements for participation:

Programming skills in at least one other language like C, C ++, Java etc.