



ID2214 Programming for Data Science 7.5 credits

Programmering för data science

Course syllabus for ID2214 valid from Spring 19

This is a translation of the Swedish, legally binding, course syllabus.

Grading scale: A, B, C, D, E, FX, F

Education cycle: Second cycle

Main field of study: Computer Science and Engineering

Intended learning outcomes

The student is expected to be able to on completion of the course:

- apply methods to import combine and convert data to appropriate format for data analysis
- explain, implement and apply algorithms for supervised and unsupervised machine learning
- explain, implement and use evaluation methods and performance measurements for supervised and unsupervised machine learning
- apply methods to visualise and draw conclusions of results of data analysis.

Course main content

- Syntax and semantics for programming languages that are particularly suited for data science, e.g. Python, Julia.
- Routines for importing, combining, transforming and selecting data.
- Algorithms for handling missing values, discretisation and dimensionality reduction.
- Algorithms for supervised machine learning, e.g. naïve Bayes, decision trees, random forests.
- Algorithms for unsupervised machine learning e.g. k-means clustering.
- Libraries for data analysis.
- Evaluation methods and performance metrics.
- Visualising and analysing results.

Language of instruction

Language of instruction is specified in the course offering information in the course and programme directory.

Eligibility

Admitted to the Master's (120 credits) programme at KTH in the main field of study.

Literature

I. Witten, E. Frank, M. Hall and C. Pal, *Data Mining: Practical Machine Learning Tools and Techniques (4th ed.)*, Morgan Kaufmann, 2016 ISBN: 9780128042915.

J. VanderPlas, *Python Data Science Handbook: Essential tools for working with data (1st ed.)*, O'Reilly Media Inc., 2016 ISBN: 9781491912058.

Examination

- INL1 - Assignment, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F

Written examination. Written assignments.