

Machine Learning

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Objectives

- ❑ understand and explain basic concepts of machine learning
- ❑ understand formalized concepts and methods
- ❑ be able to implement concepts and methods in the form of algorithms
- ❑ be able to sensibly select, adapt, and apply relevant methods
- ❑ be able to educate oneself

Related Fields

1. Statistics [paradigms, models]
2. Mathematics
3. Information Retrieval [methods, algorithms]
4. Knowledge Processing
5. Heuristic Search
6. Decision Support Systems [applications]
7. Artificial Intelligence
8. Web Technology

Literature

Machine Learning:

- ❑ C.M. Bishop. [[Interview 2018 @ MS Research](#)]
Pattern Recognition and Machine Learning
2nd edition, Springer 2006.
- ❑ N. Cristianini, J. Shawe-Taylor.
An Introduction to Support Vector Machines and Other Kernel-based Learning Methods
Cambridge University Press, 2000.
- ❑ T. Hastie, R. Tibshirani, J. Friedman.
The Elements of Statistical Learning
2nd edition, Springer, 2009. statweb.stanford.edu/~hastie/ElemStatLearn/ (2017)
- ❑ T. Mitchell.
Machine Learning
1st edition, McGraw-Hill, 1997. www.cs.cmu.edu/~tom/mlbook.html
- ❑ V. Vapnik.
The Nature of Statistical Learning Theory
2nd edition, Springer 2000.
- ❑ I. Goodfellow, Y. Bengio, A. Courville.
Deep Learning
MIT Press, 2016. deeplearningbook.org

Software

Programming:

- ❑ The Jupyter Project
JupyterHub
Version 1.4.2 jupyter.org
- ❑ Microsoft Corporation.
Visual Studio Code
Version 1.61.0 code.visualstudio.com
- ❑ JetBrains, Inc.
PyCharm IDE
Version 2021.1.1. www.jetbrains.com/pycharm

Machine Learning:

- ❑ *NumPy*
Version 1.21.1. numpy.org
- ❑ *scikit-learn: Machine Learning in Python*
Version 1.0 scikit-learn.org

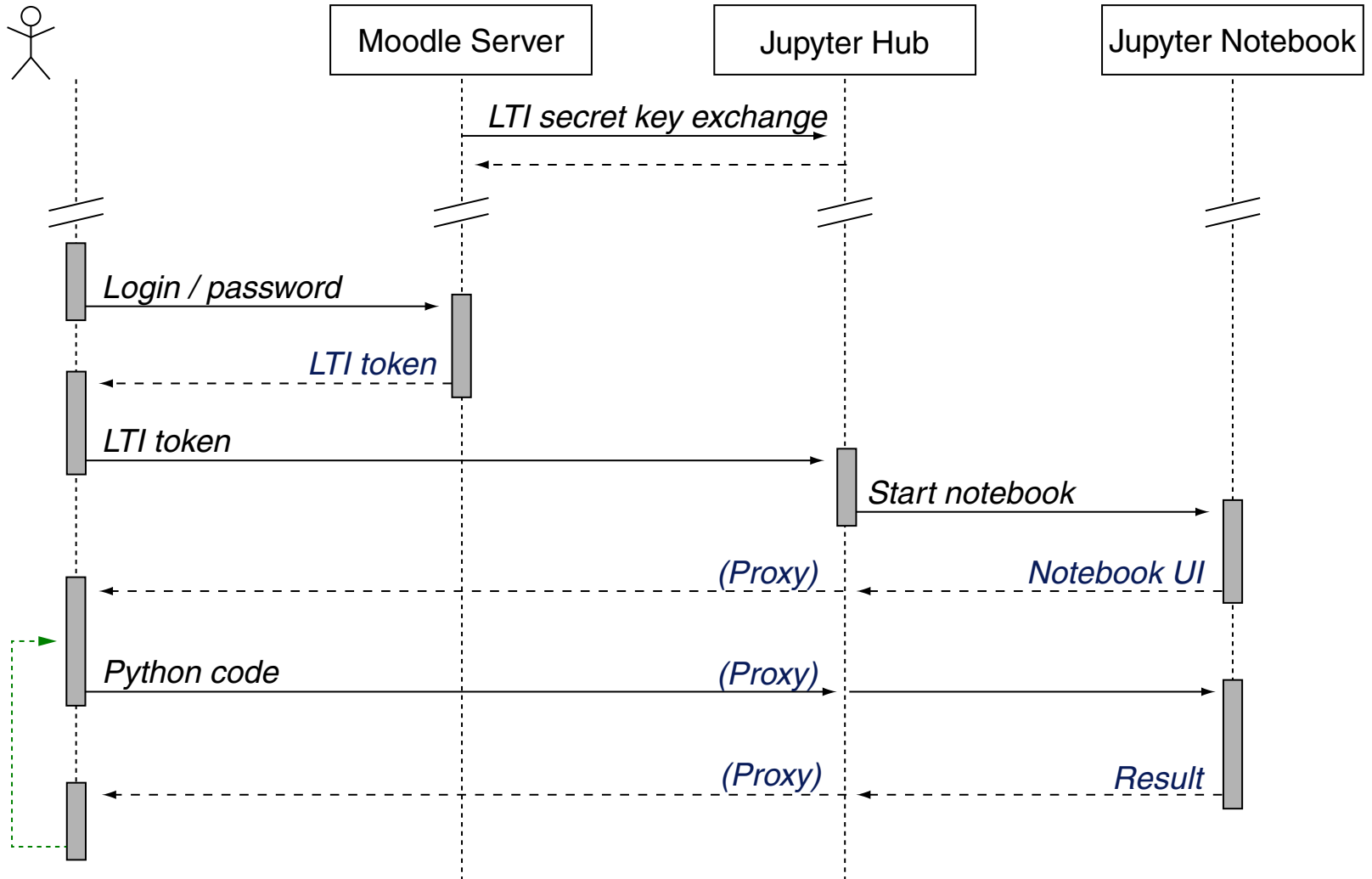
Software

Statistics:

- ❑ R Development Core Team.
R
Version 4.1. www.r-project.org
- ❑ E. Jones, T. Oliphant, P. Peterson and others.
SciPy
Version 1.21. www.scipy.org
- ❑ J.W. Eaton.
GNU Octave
Version 6.3. www.gnu.org/software/octave

Software

Lab Class Setup



Software

Lab Class Setup (continued)

