Introduction to Python and Machine Learning

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https://goo.gl/WC8Wgi

Outline

- Introduction to Python
- What is Anaconda?
- What is PIP?
- Jupyter Notebook
- Basics
- Operators and Expressions
- Control Flow
- Functions
- Modules
- Object Oriented Programming
- Introduction to Machine Learning
- Loading the Dataset
- Summarizing the Dataset
- Visualizing the Dataset
- Prediction using Machine Learning
- Evaluating the results

Introduction to Python

- Free and Open-Source
- Readable, very clear syntax
- On average, 3.5 times smaller code than Java/C++
- No declarations of arguments or variables
- Dynamic declaration and use of variables
- Python is interpreted (not compiled)
  - Compiler: a lot of time for processing the code, faster execution
  - Interpreter: almost no processing of the code, slower execution

What is Anaconda?

- Free and Open-Source
- Package Manager and Distribution of Python
- Optimized for Data Science and Machine Learning
  - conda –V
  - conda create -n NAME python=3.6
  - conda env list
  - conda activate NAME (or activate NAME)
  - python --version

What is PIP?

- It is a package manager for python
- PIP stands for PIP Installs Python
- A package is all the files you need for a module
- A module is code libraries you can include in your project
- Anaconda automatically installs pip for you
  - pip install jupyter
  - pip install pandas
  - pip install sklearn
  - pip install -r requirements.txt

Jupyter Notebook

- cd WORKSHOP_DIR
- jupyter notebook

The basics of python

- jupyter notebook
- If you don’t have jupyter notebook installed:
  - https://github.com/nimamahmoudi/python-ml-workshop-2019/blob/master/introduction_to_python.ipynb

Useful Links

- https://github.com/nimamahmoudi/python-ml-workshop-2019
- https://www.anaconda.com
- https://www.python.org
- https://www.jetbrains.com/pycharm/
- https://jupyter.org/
- https://pypi.org
- https://pypi.org/project/pip/
- https://python.swaroopch.com/
- https://www.slideshare.net/saketkc/python-workshop-11152935

Introduction to Machine Learning with Python

Introduction to Machine Learning

Machine learning is a field of artificial intelligence that uses statistical techniques to give computer systems the ability to ”learn” (e.g., progressively improve performance on a specific task) from data, without being explicitly programmed.

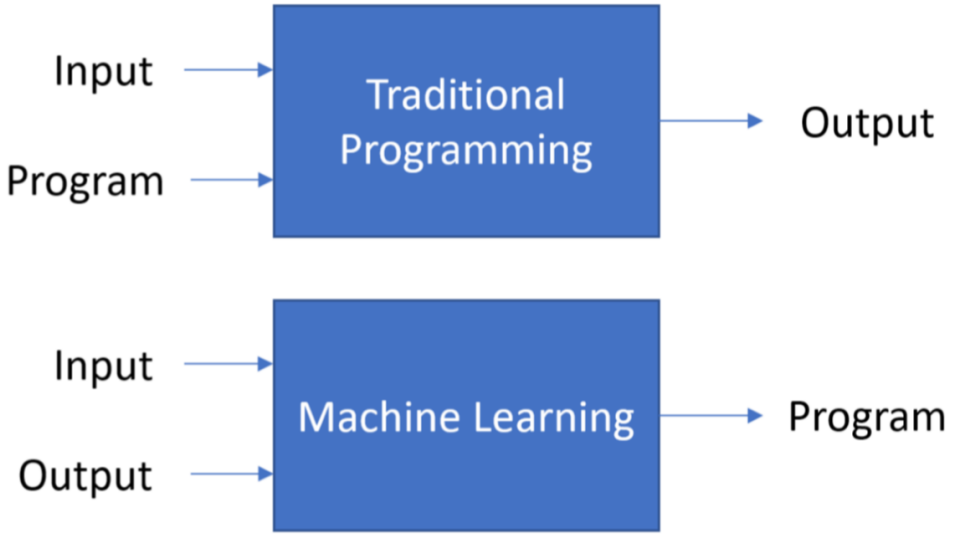
- – Arthur Samuel, 1959

A computer is said to learn from experience E with respect to some class of tasks T and performance measure P, if its performance at task T, as measured by P, improves with experience E.

- – Tom Mitchel, 1959

Simple Definition

- We have a set of examples from which we want to extract regularities (patterns).



Method Classification

Supervised

The training data you feed to the algorithm includes the desired output.

E.g. Face recognition

Unsupervised

The training data is unlabeled. Thus, the system tries to learn without a teacher.

E.g. Classify users into 10 groups

Semi-Supervised

We have a lot of unlabeled data and a little bit of labeled data.

E.g. Google Photos

Problem Types

- Classification
  - In classification, the aim is to assign each input vector to one of finite number of discrete categories.
    - E.g. Email spam filtering (Spam or Ham)
- Regression
  - If the desired output consists of one or more continues variables, the task is called Regression.
    - E.g. Predict the price of a house

Introduction to Machine Learning using Python

- jupyter notebook
- If you don’t have jupyter notebook installed:
  - https://github.com/nimamahmoudi/python-ml-workshop-2019/blob/master/introduction_to_ml.ipynb

Useful Links

- https://github.com/nimamahmoudi/python-ml-workshop-2019
- https://en.wikipedia.org/wiki/Iris_flower_data_set
- https://machinelearningmastery.com/machine-learning-in-python-step-by-step/
- https://scikit-learn.org
- https://pandas.pydata.org
- https://matplotlib.org
- http://www.numpy.org

What’s next?

- Check out the links
  - Look through each library
  - Try simple projects
- Take an online course!
- Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems
  - By Aurélien Géron
  - Great book, especially for beginners.