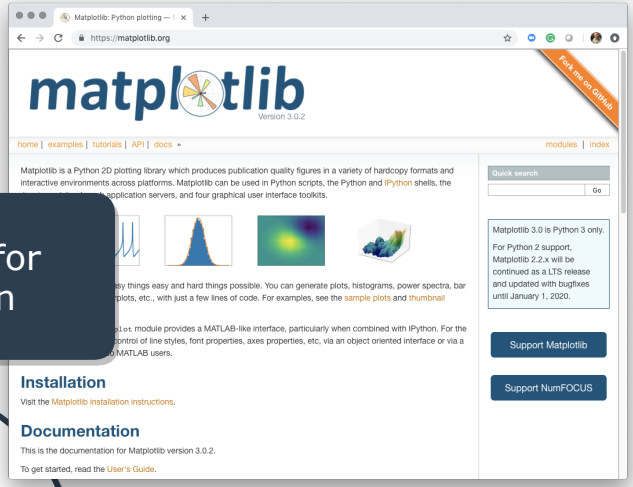
Data Science with Python Workflow



Click the links for Documentation

CS = Cheat Sheet

Pandas (CS)

Import

Pandas
I/O tools
SQLAlchemy

Tidy

Pandas
data structures
group by
joins & merge
reshape (pivot)

Pandas
text
time series
categorical
missing

Numpy

Transform

Visualize

matplotlib
seaborn
plotnine
plotly (CS)

Model

Pycaret
Scikit-Learn
Statsmodels
TensorFlow
Keras

Communicate

JupyterLab
Papermill
Dash
Streamlit
Flask
FastAPI

Jupyter
VSCode
Pycharm
RStudio
Spyder

Important Resources

- **Anaconda Distribution:** https://www.anaconda.com/download/
- **Python Documentation:** https://docs.python.org/
- **Python Standard Library:** https://docs.python.org/3/library

version: 2.0

Data Science with

Special Topics

Time Series Forecasting

- sktime - Scikit-Learn Extension for Time Series
- statsmodels - Time Series Analysis
- GluonTS - MXNet/Gluon Deep Learning for Time Series

Time Series Features

- TSFresh - Time Series Feature Engineering
- tslearn - Time Series Features
- Pandas Time Series
- Arrow - Human-Friendly Time

EDA

- pandas-profiling, SweetViz, lux

Web

- beautifulsoup - Extract data from HTML
- requests-html - HTML Parsing
- scrappy - Web crawling

MS Office & PDF

- XlsxWriter - Create Excel Workbooks
- pyexcel -Read/Write Excel
- xlwings - Call python from Excel
- python-docx - Word Documents
- python-pptx - PowerPoint Documents
- pdfminer - Text extraction from PDF
- textract - Extract text from any document
- PyPDF2 - Create PDF documents
- gspread - Google Sheets

Text Analysis & NLP

- NLTK - Text Tokenization & Modeling
- spaCy - NLP using Cython for Speed
- fuzzywuzzy - Fuzzy String Matching

Recommendation Systems

- Annoy - Approximate Nearest Neighbors
- LightFM - Popular recommendation algo's.

Apps & APIs

- FastAPI - Web framework for building APIs in Python
- Flask - Web Development
- Dash & Streamlit - DS Web Frameworks

MLOps

- Pycaret MLFlow Integration
- MLFlow - Machine Learning Lifecycle, Tracking, Deployment
- MetaFlow - Scalable AWS Jobs for Data Scientists

Cloud

- boto3 (AWS) - AWS Python SDK
- Google Cloud - GCP Python SDK
- Azure - Azure Python SDK

ETL & Automations

- Airflow - Workflow Scheduling & Monitoring
- Luigi - Batch Job Tool, Scheduling, Monitoring
- Ansible - Deployment Automation
- JobLib - Run python jobs

Machine Learning

- Scikit-Learn - ML in Python
- H2O - Scalable & AutoML
- TPOT - TPOT Automated ML Tool
- PyCaret - PyCaret Low Code ML
- Dask ML - Scalable ML with Dask
- ML Packages: XGBoost, LightGBM, CatBoost

Feature Engineering

- Sklearn Data Transformations
- sklearn-pandas - Sklearn Extension for Pandas
- Featuretools - Automated Feature Engineering
- category_encoders - Categorical Encoding
- imbalanced-learn - Resampling for Imbalanced
- fancyimpute - Extended imputation strategies

Deep Learning

- TensorFlow & Keras
- PyTorch
- MXNet, Gluon, & GluonTS
- OpenAI Gym - Reenforcement Learning

Image & Comp Vision

- OpenCV - Open Source Computer Vision
- Scikit Image - Image Processing
- Pillow - Python Imaging Library

Speed & Scale

- datatable - C++ Speed Up
- Dask (CS) - Parallel Pandas & Scikit Learn
- RAPIDS (CS)- GPU Accelerated Pandas
- PySpark - Spark Clusters
- Optimus - PySpark Extension for Humans

Coming from R?

- R-to-Pandas Comparison
- siuba & plydata - dplyr/tidyr ports
- datatable - data.table port
- plotnine - ggplot2 port