Basic Python for Geoscientists

Agus Abdullah, PhD

April 2020

About me…

Academic

- 2007: PhD, The Australian National University
- 2001: MSc, Applied Geophysics, ITB
- 1998: BSc, Geophysical Engineering, ITB

Career

1. Present
   - Geodwipa Cloud Computing (Founder)
   - Lecturer at Pertamina University
   - Geophysical Consultant
2. Past
   - Kuwait Oil Company
   - ExxonMobil Exploration Company, Houston Texas USA
   - ExxonMobil Oil Indonesia Company

Interests

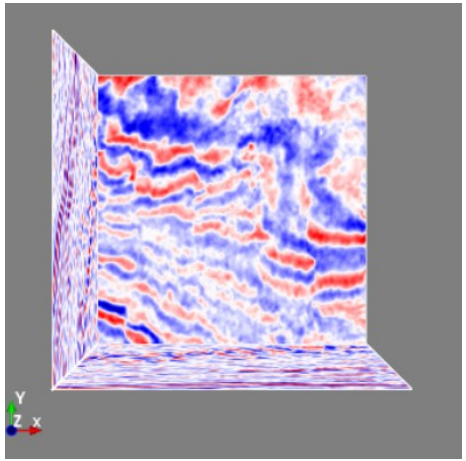
- Seismic Imaging
- Cloud Computing
- Seismic Tomography

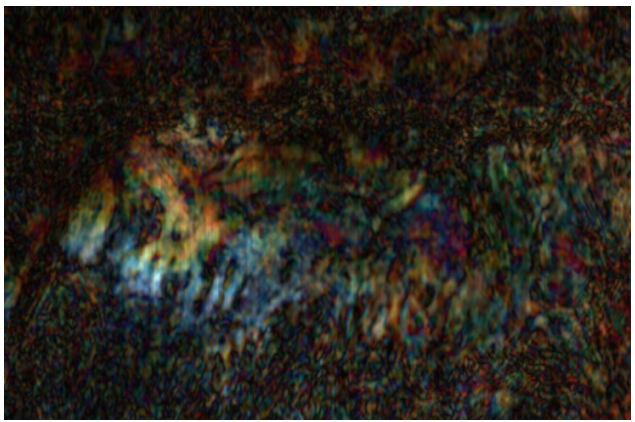
Requirements

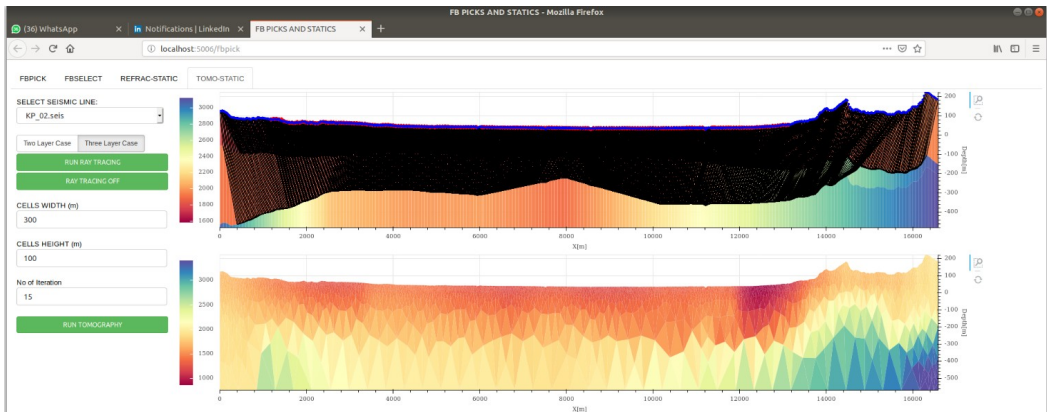
- Python 3.7.0
  - numpy
  - matplotlib
  - sklearn
  - scipy
  - pandas
  - etc
- PyCharm IDE or Jupyter Notebook

Why Python?

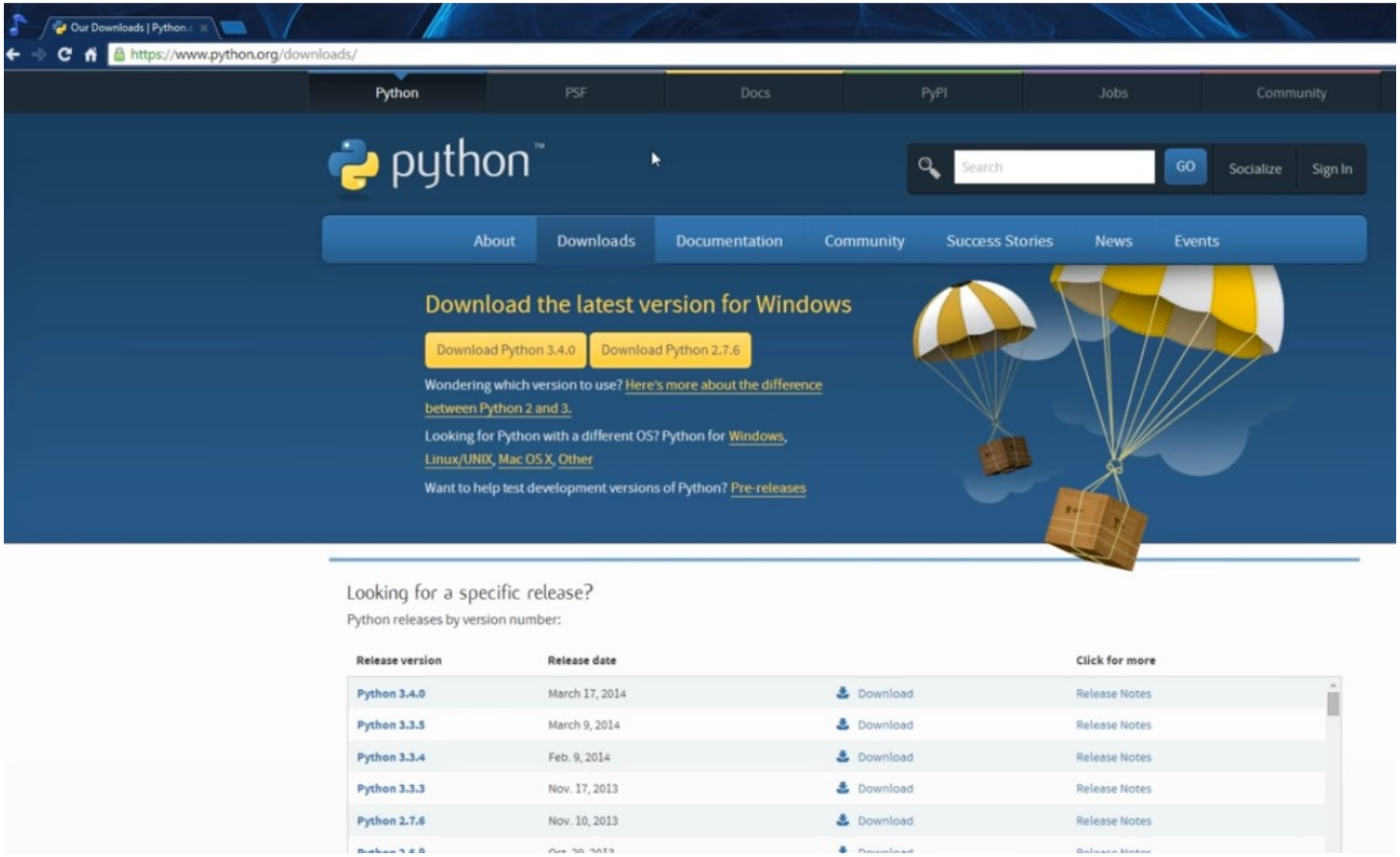
- Open source
- Big Community across disciplines
- Cross Platform
- Flexible
- Multi processing, GPU, Multi GPU...



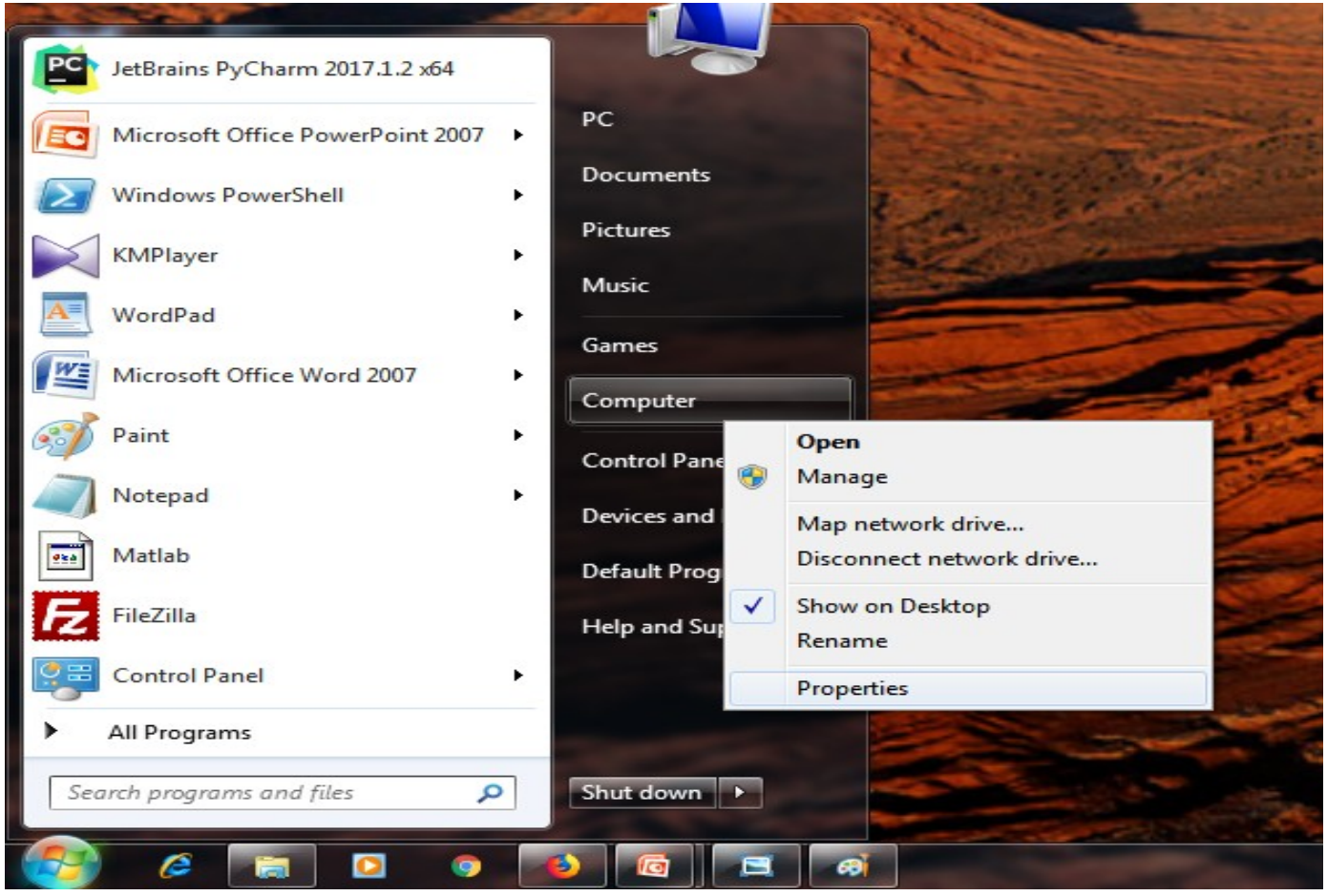




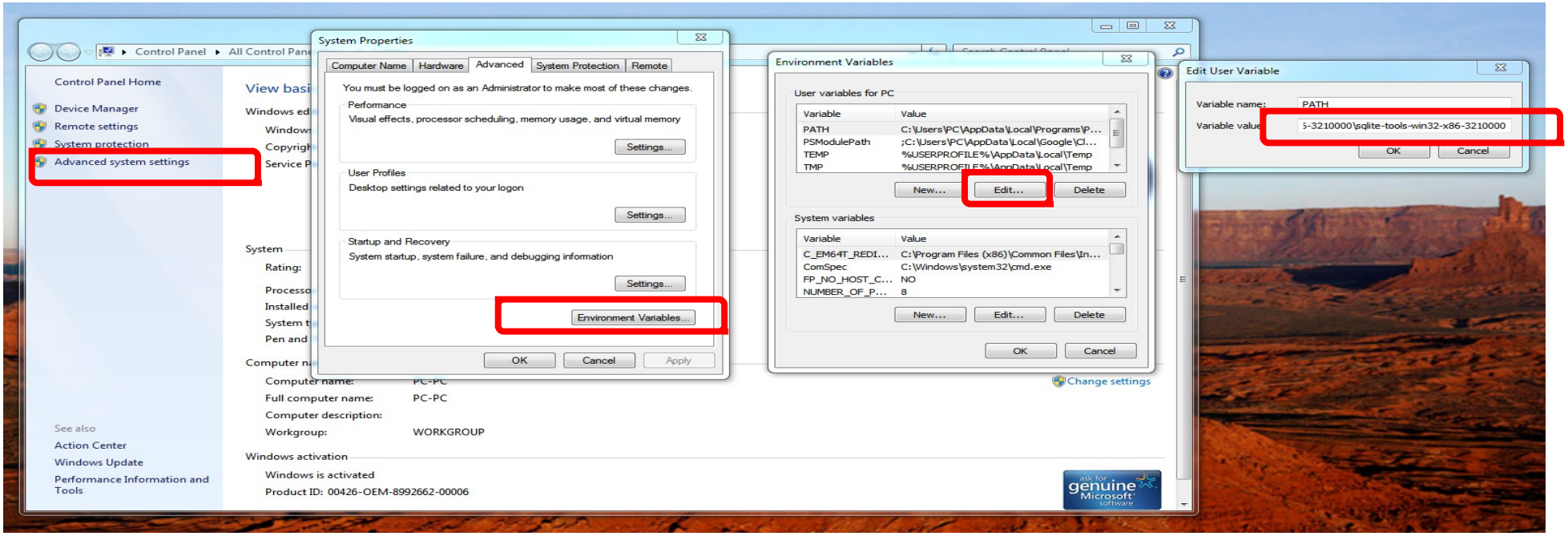
Download and install Python



Environment Settings



Environment Settings



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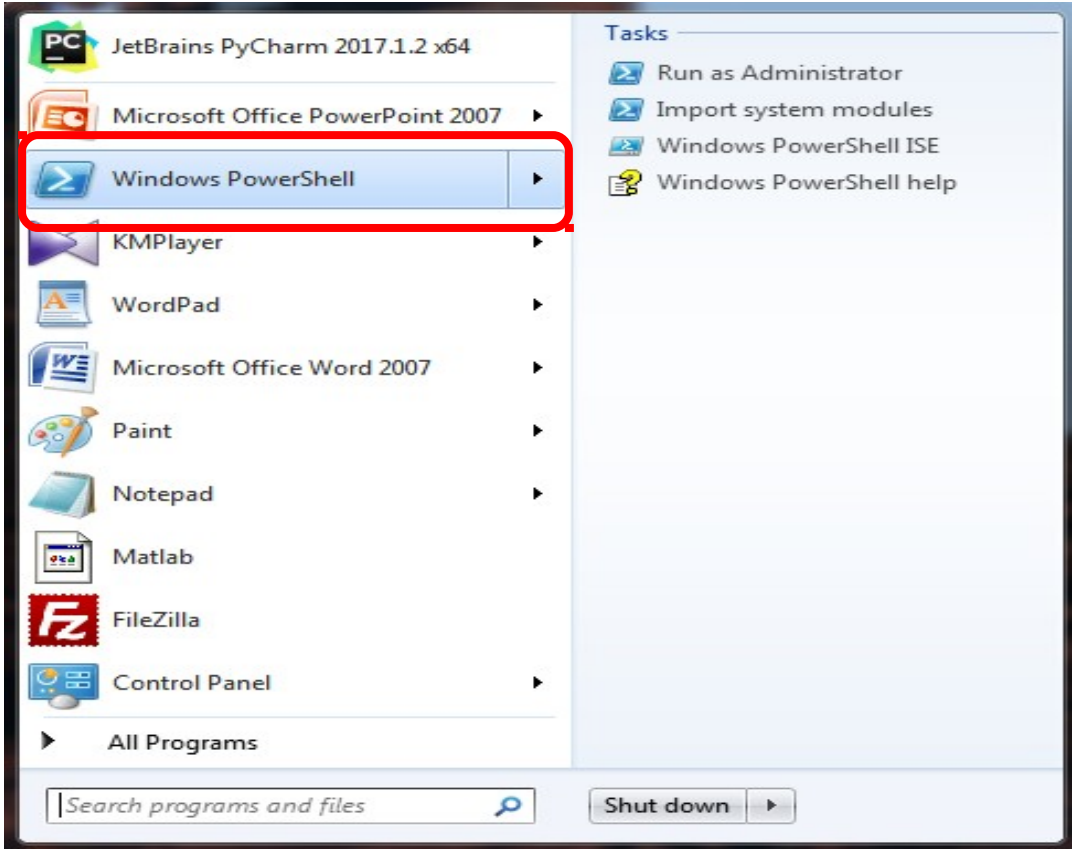
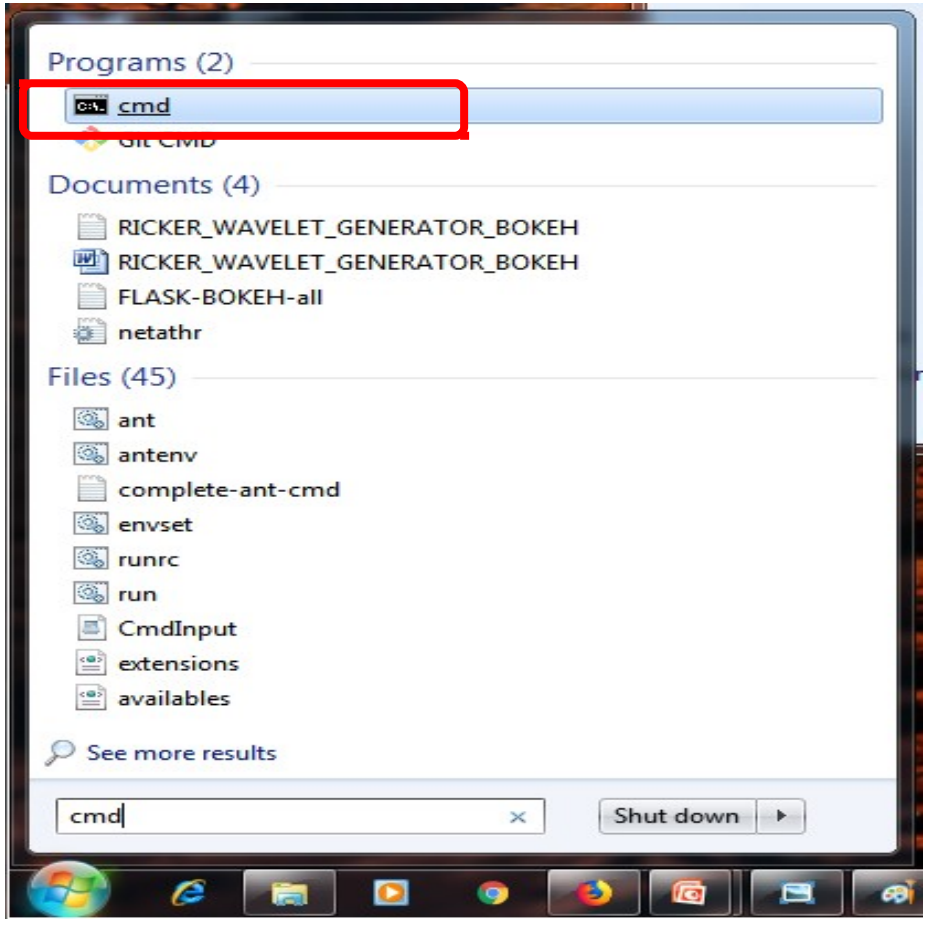
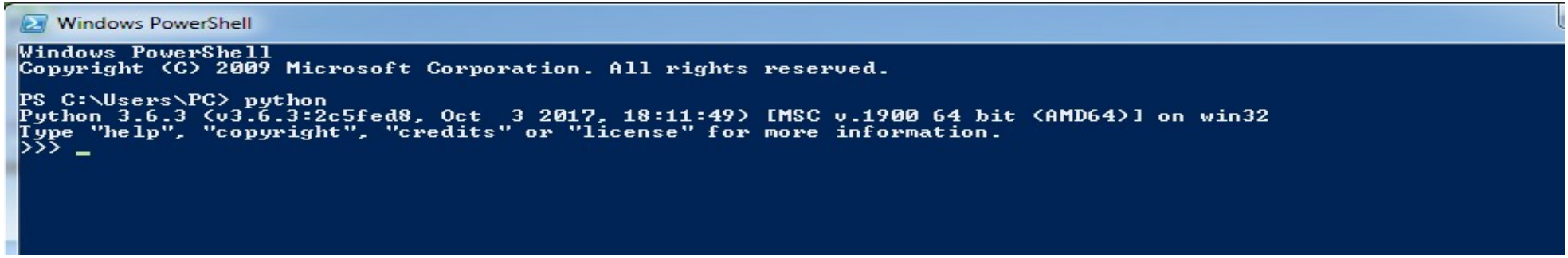
C:\Users\PC\AppData\Local\Programs\Python\Python36\;

Environment Settings



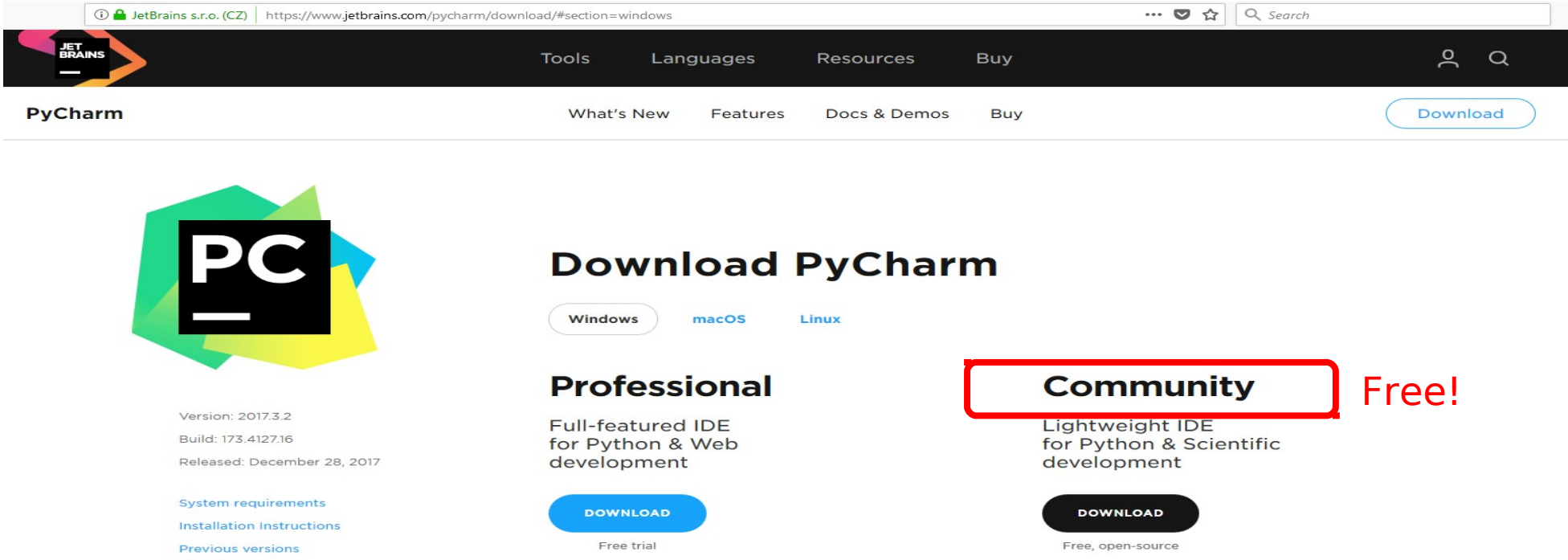


Access python via cmd



python –m pip install numpy

PyCharm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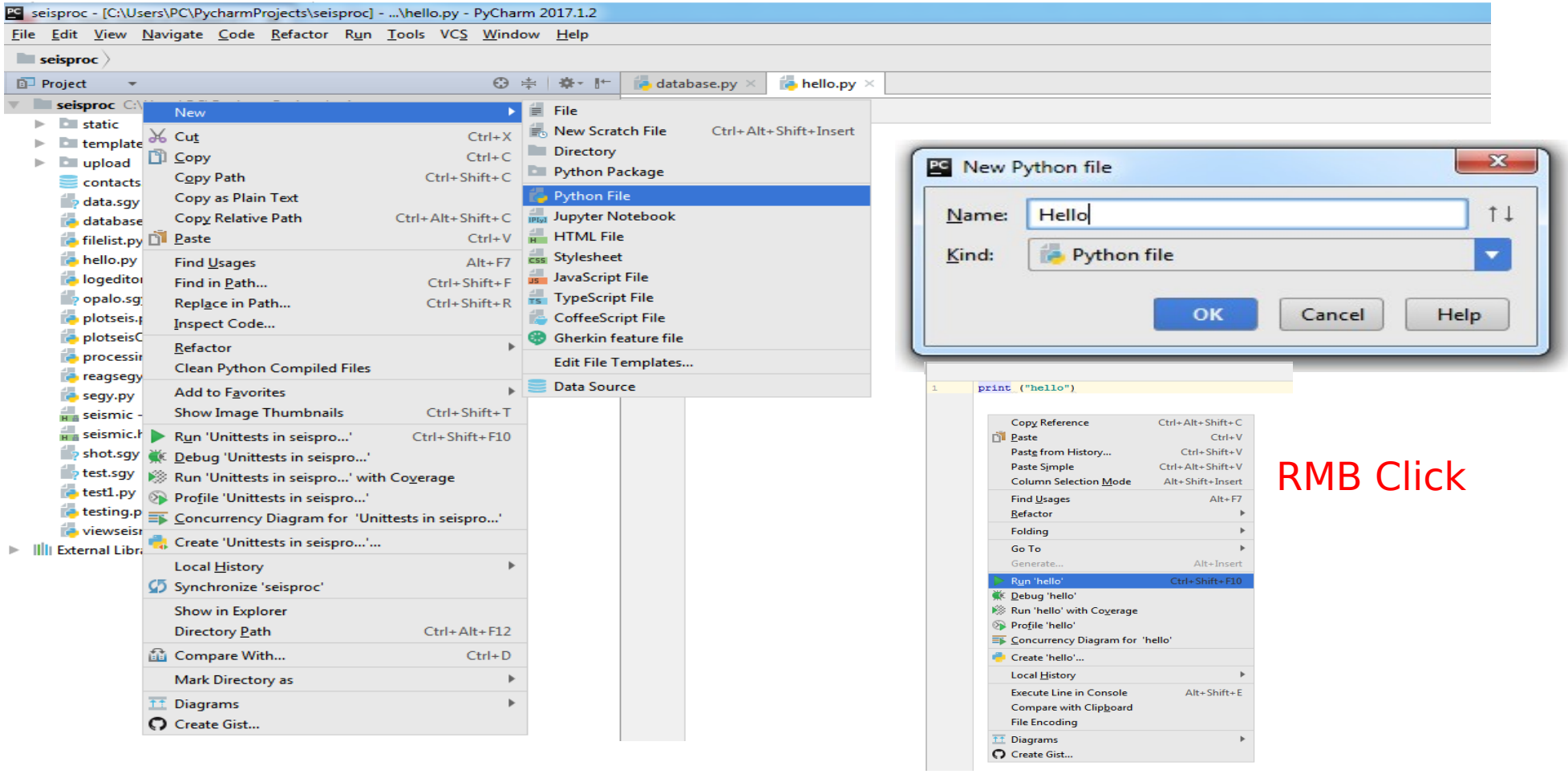
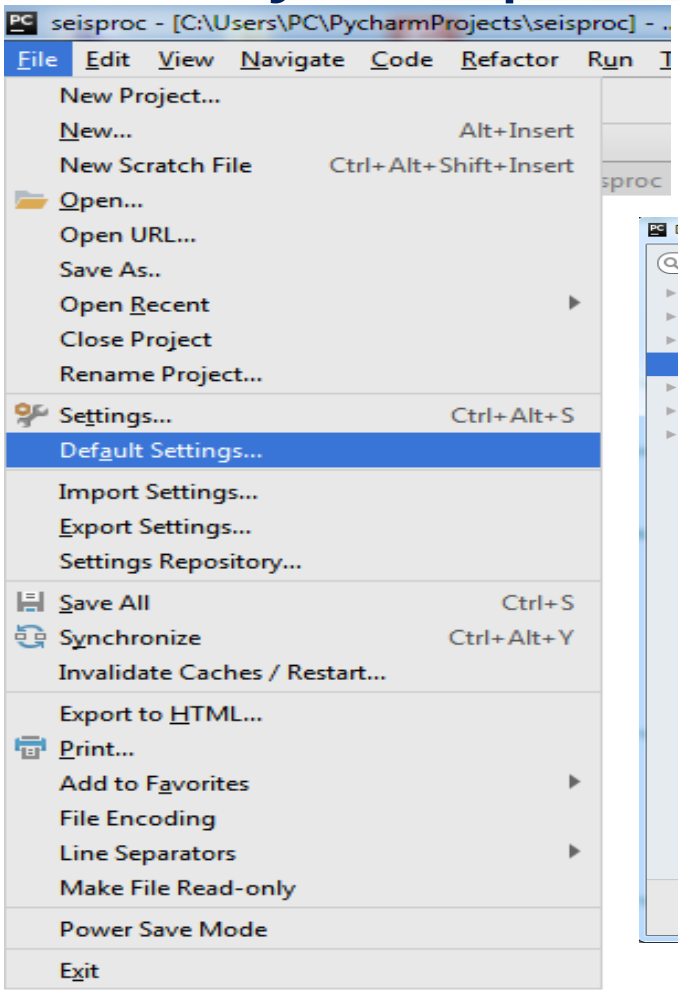
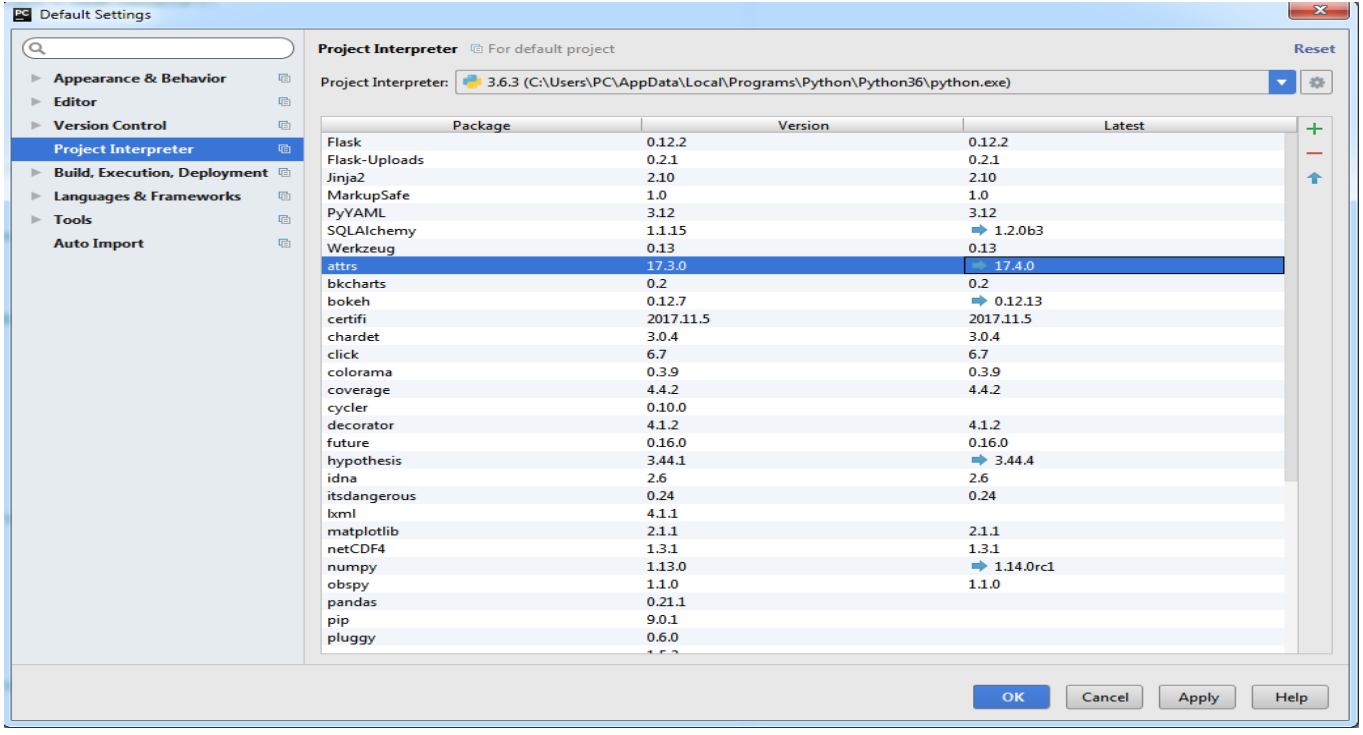
First Project



Install Python package via Pycharm

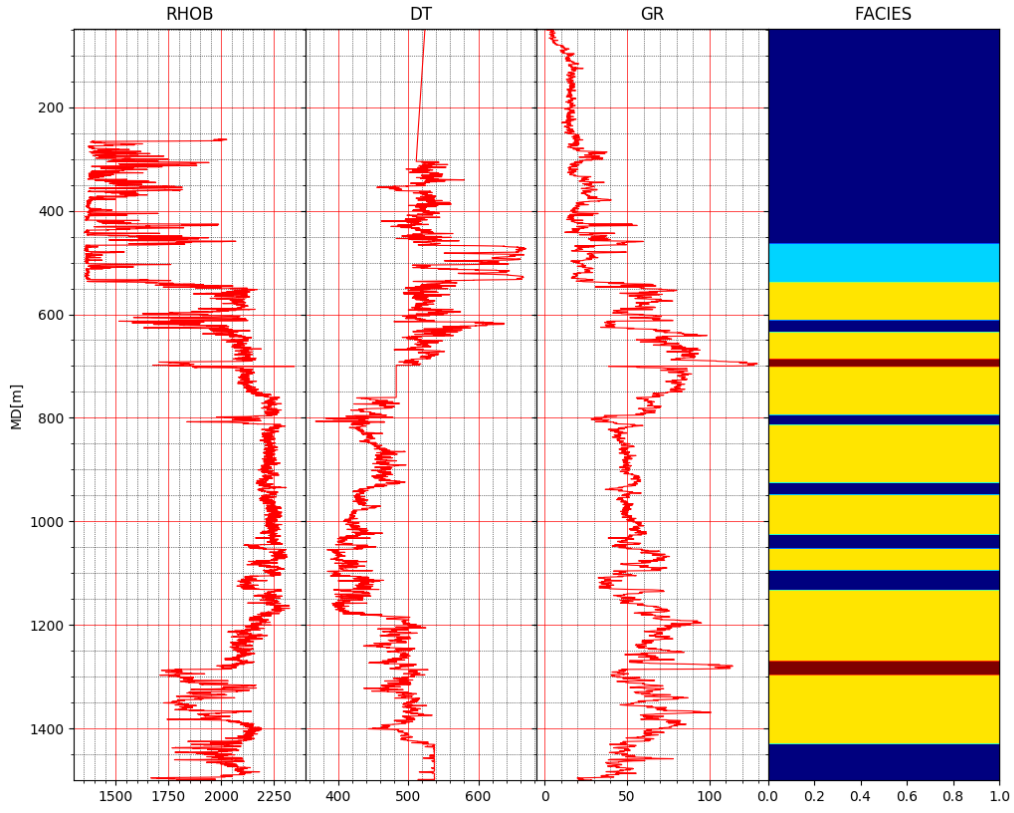




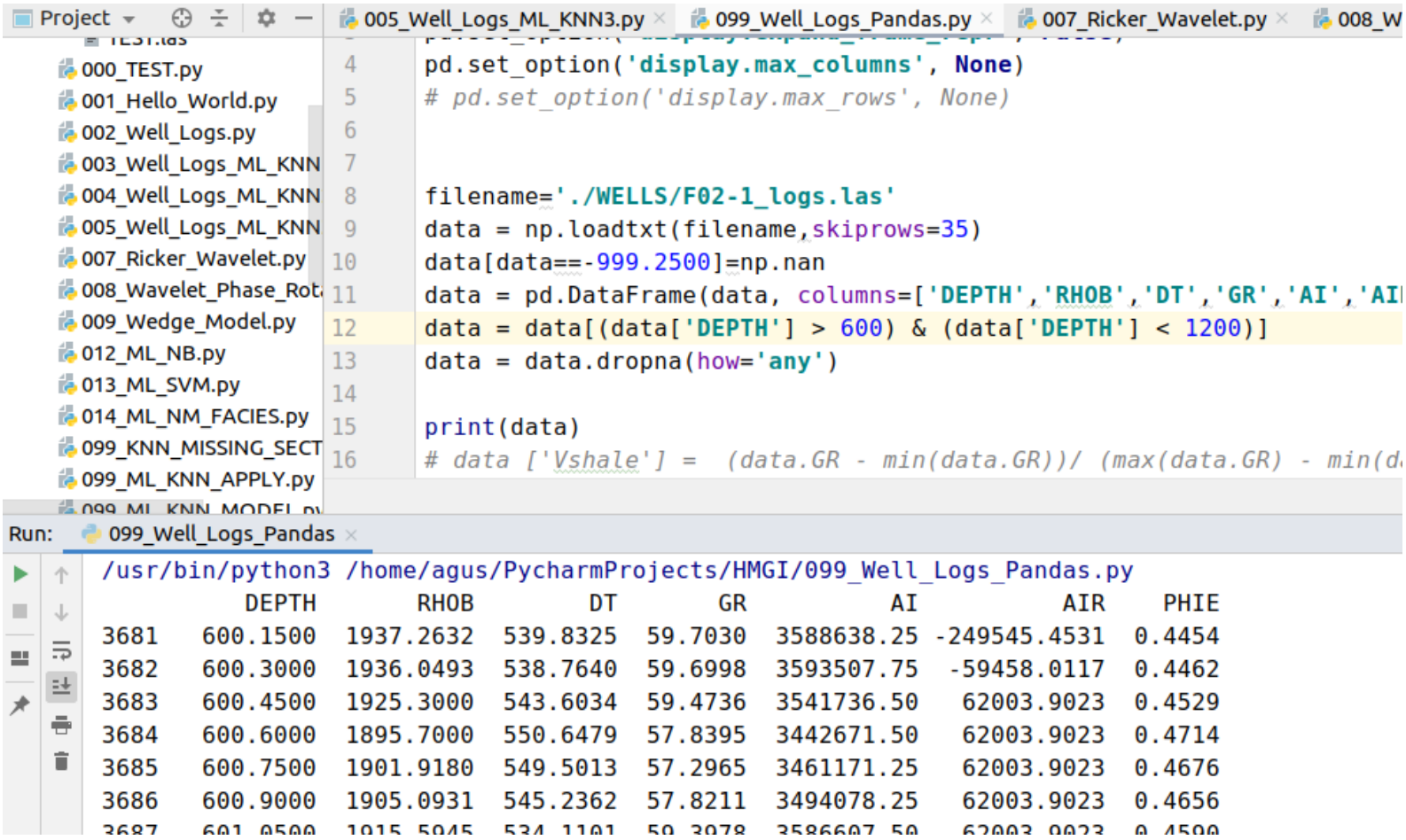
Topics

- Well logs file handling (I/O)
- Well logs visualization and computation
- Facies Prediction ML-KNN
- Geophysical Signal: Ricker wavelet
- Seismic modeling and visualization

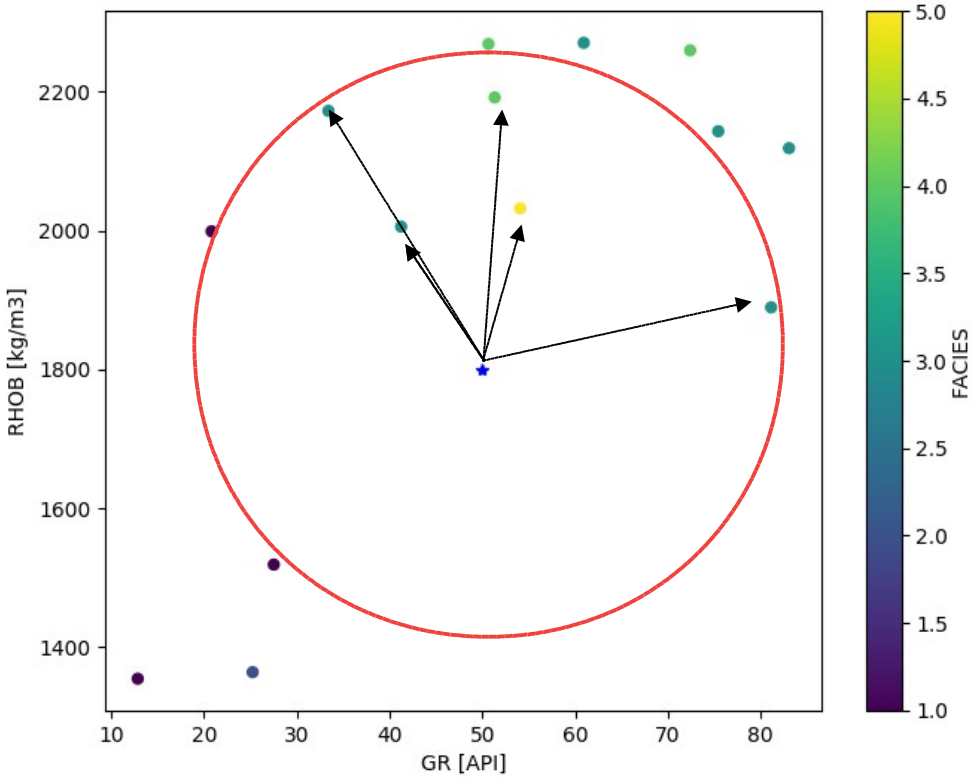
Well logs visualization

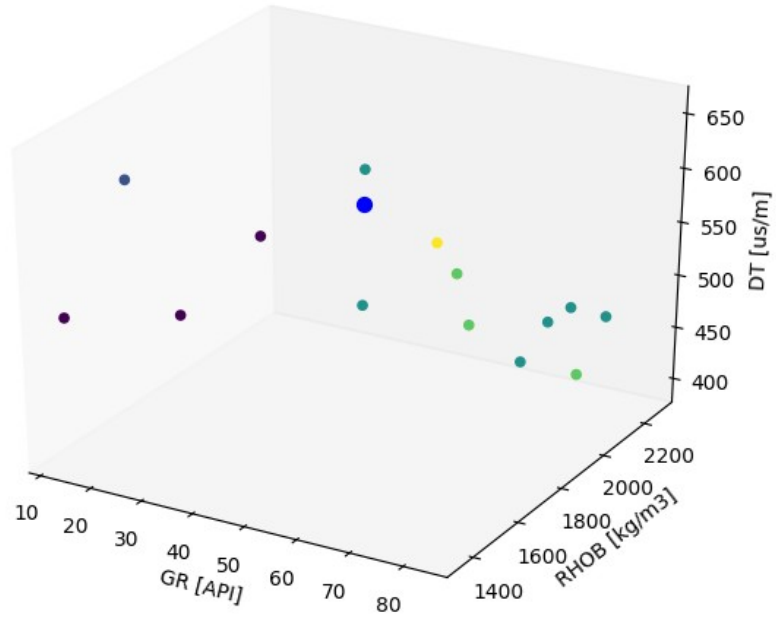


Well logs computation using pandas



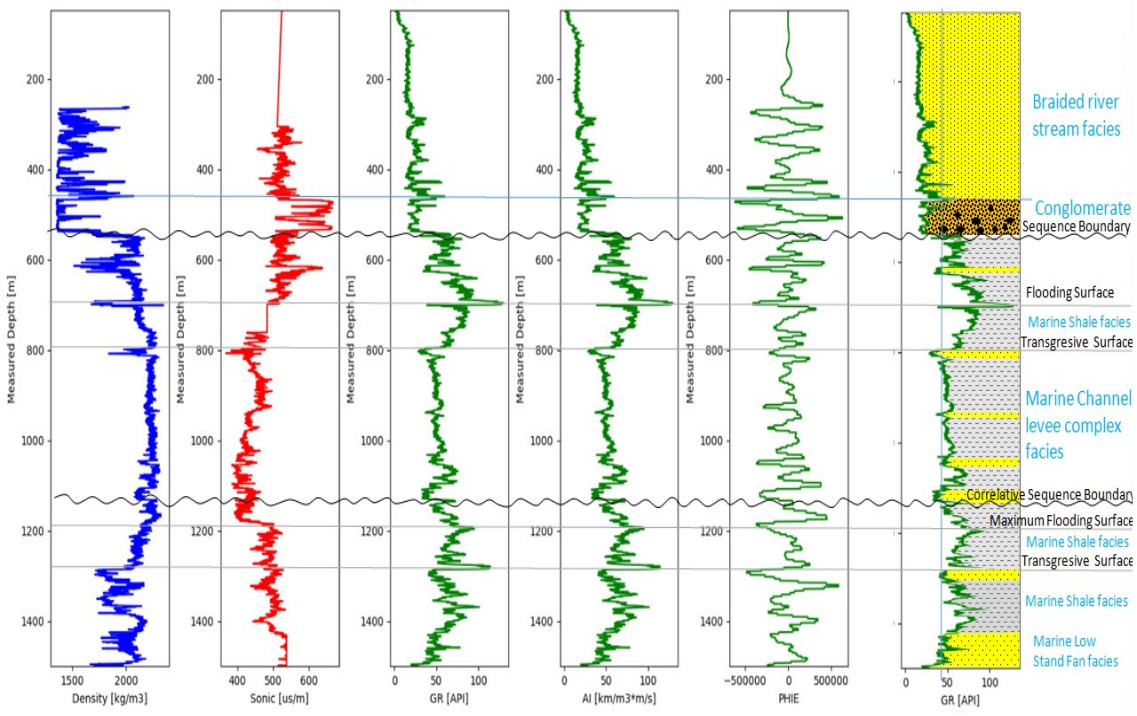
Facies prediction ML-KNN

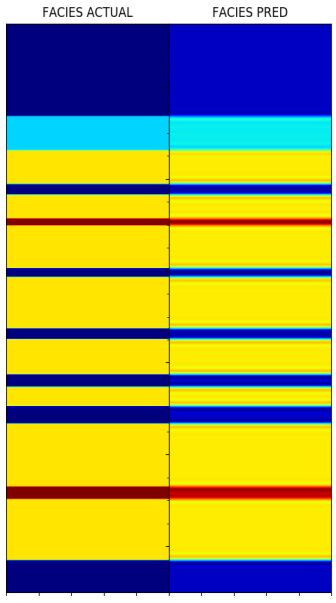




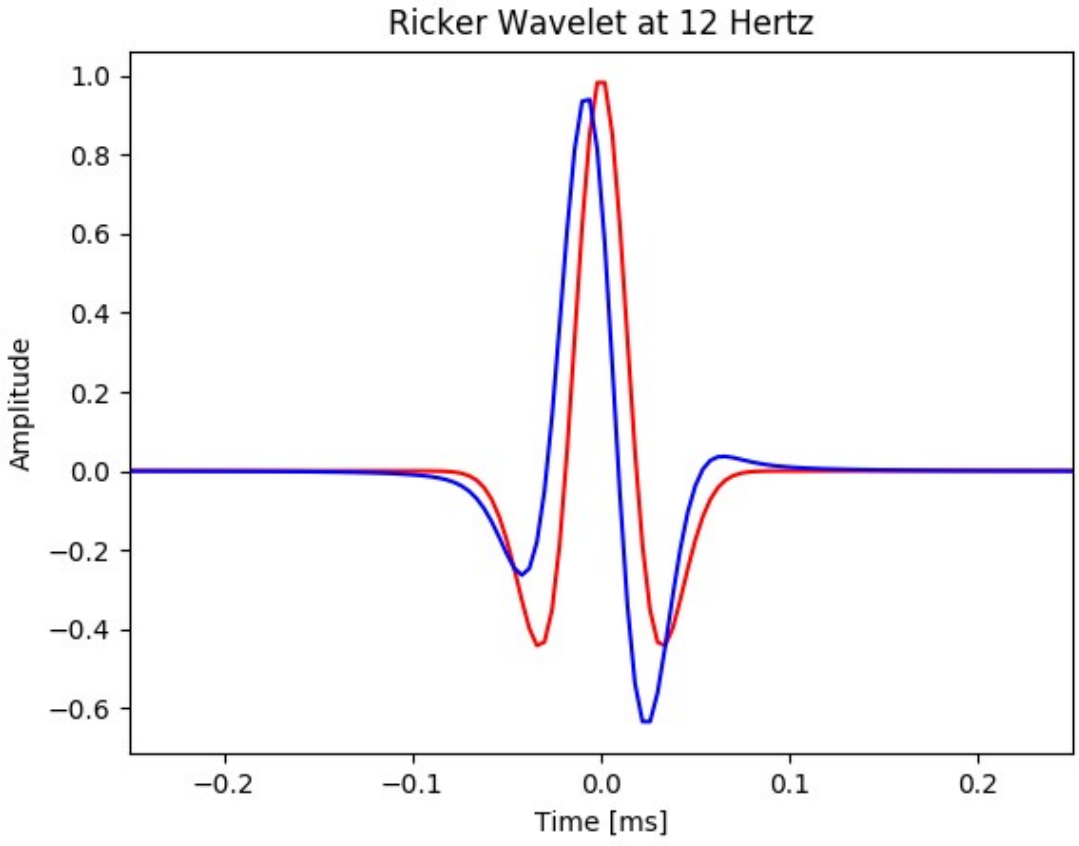
In some cases parameters normalization is required prior to KNN

Facies prediction ML-KNN

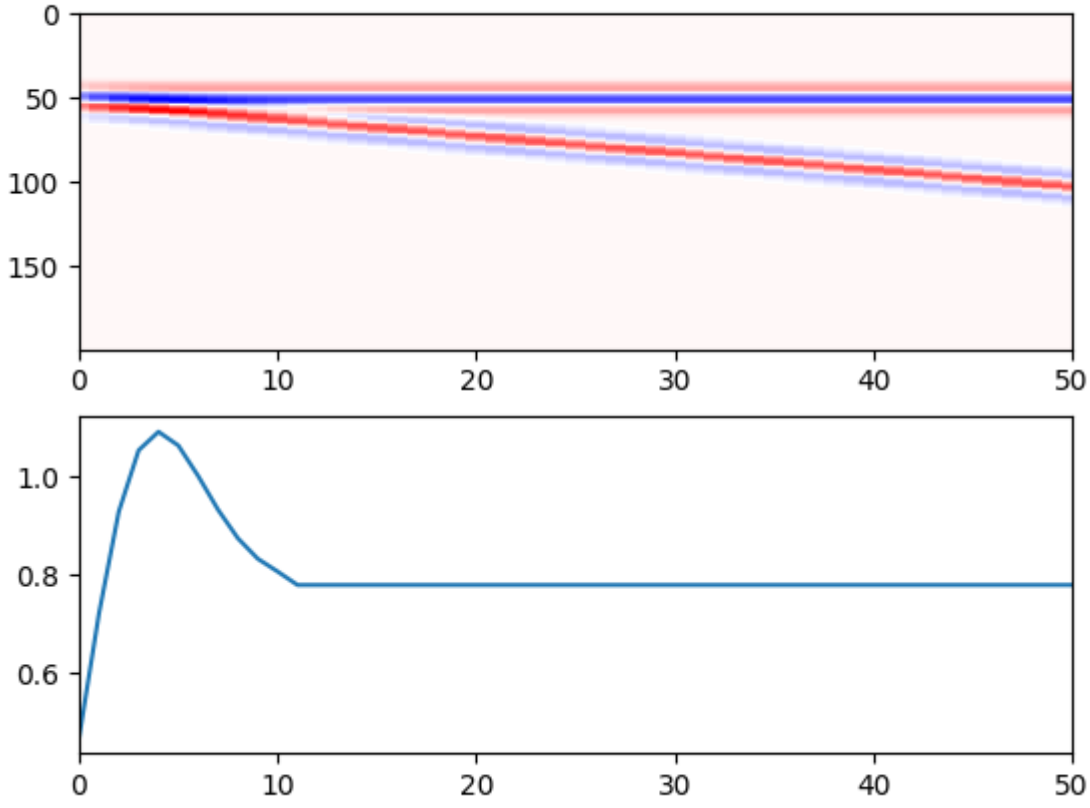




Ricker wavelet and phase rotation



Seismic Modeling



Thank You