Introduction to Python
for Mining Geoscientists

This course is an introduction to the use of Python for geoscientists, emphasizing on statistical analysis and graphical displays using practical examples from the mining industry.

Duration: 5 days.

Who should attend: Resource Geologists, Mine Geologists, Rock Geologists, Mine Engineers and anyone working with drillholes, block models and any other spatial data.

Pre-requisites: No background in coding required.

Objectives: Get an understanding of what can be done using Python for geological data validation, modeling and reporting.

At the end of the training, participants will be able to :

- Setup a Python environment from scratch
- Understand basic coding in Python
- Import points, grids, drillholes or wireframes in Python
- Put data into custom graphics
- Write procedures to automate tasks such as reporting

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Agenda

Day 1 & 2: Getting Hands on Python

- Python environment installation
- Introduction to Jupyter notebook and alternatives
- Overview of useful Python libraries and illustrations
- Python coding basics:
    - Importing functions
    - Variables types
    - Loops “for/while”
    - List management, dictionary and tuples
    - Reading Python library documentation

Day 3: Focus on Data Preparation & EDA

- Data loading, filtering, cleaning and visualization
- Use of Pandas, Matplotlib, Plotly, Seaborn libraries
- Exercises on mining datasets

Day 4 & 5: A Dive in Geostatistical Workflows

This session can be performed on trainee’s data (preparation required).

- Desurveying, compositing, declustering
- Geological hypothesis and spatial statistics:
    - Domaining
    - Variography
- Estimations
    - Kriging & Simulation
    - Validation
- Automated reporting