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Webinar Python Scripting in FME

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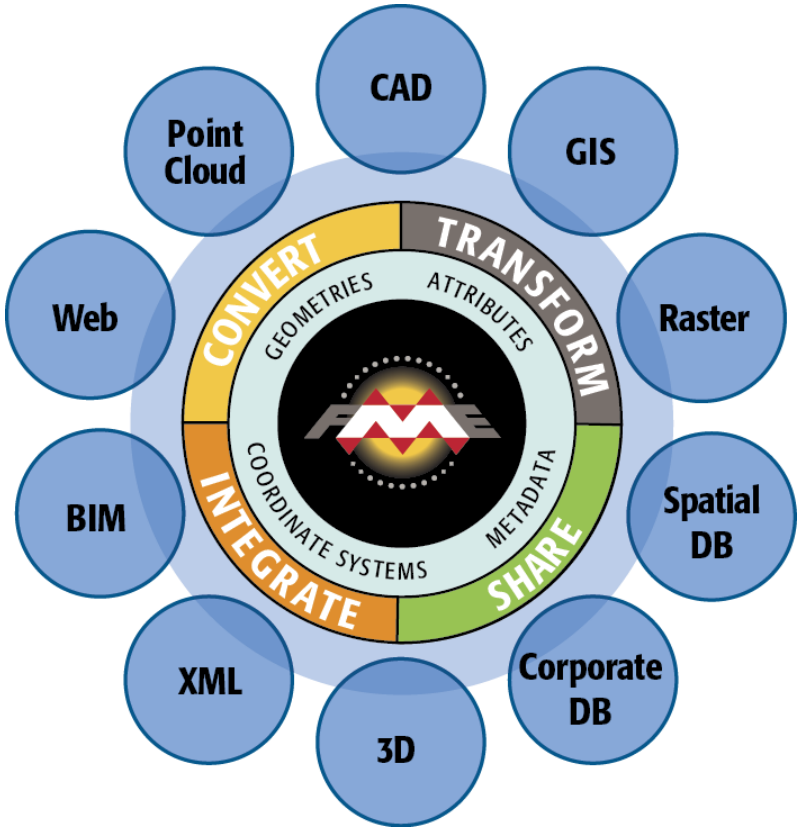
Poll: About You #1

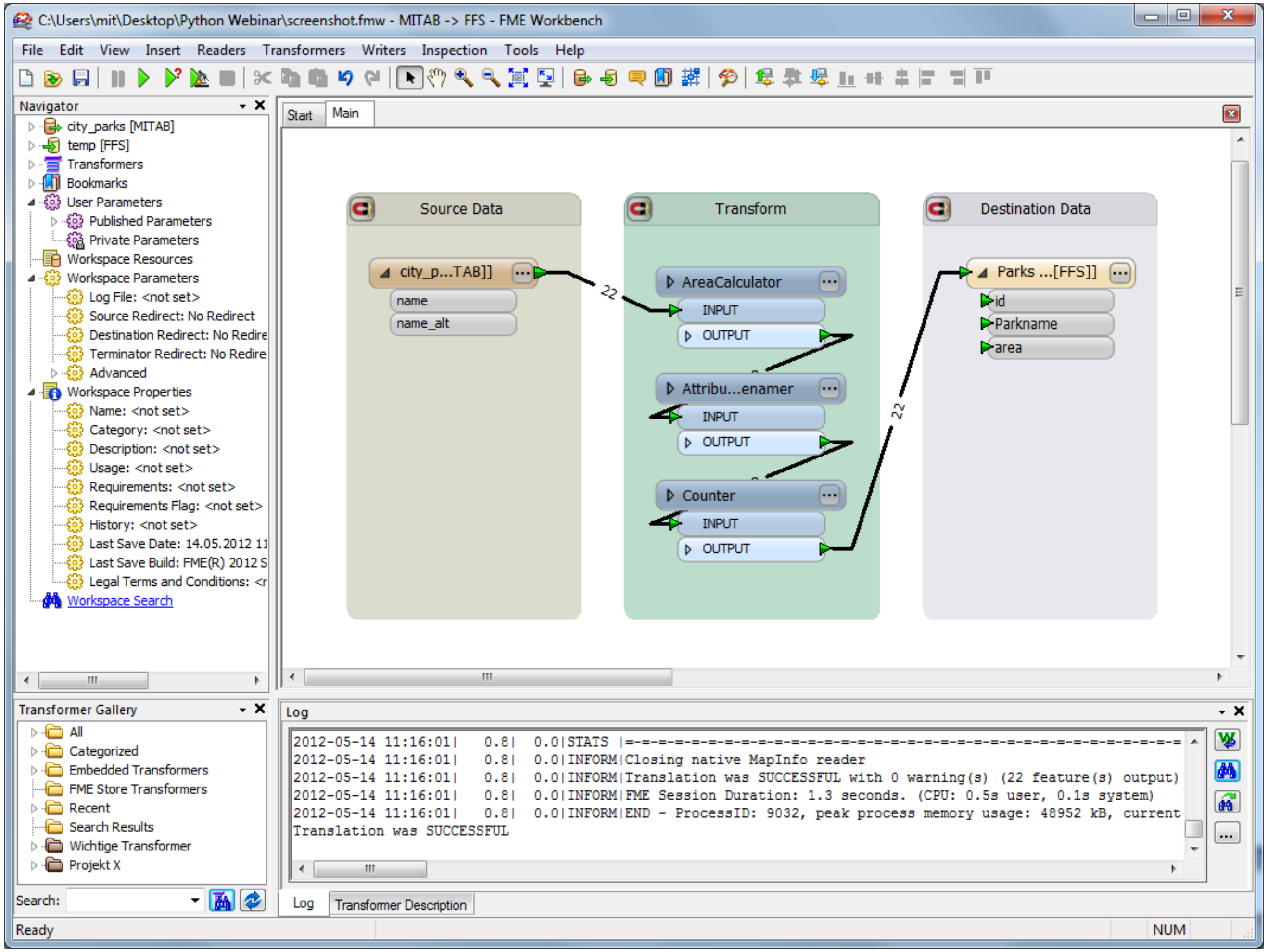
- **How long have you been using FME?**

  > Never
  > Less than 1 year
  > 1-2 years
  > More than 3 years

Powering the Flow of Spatial Data



FME Workbench



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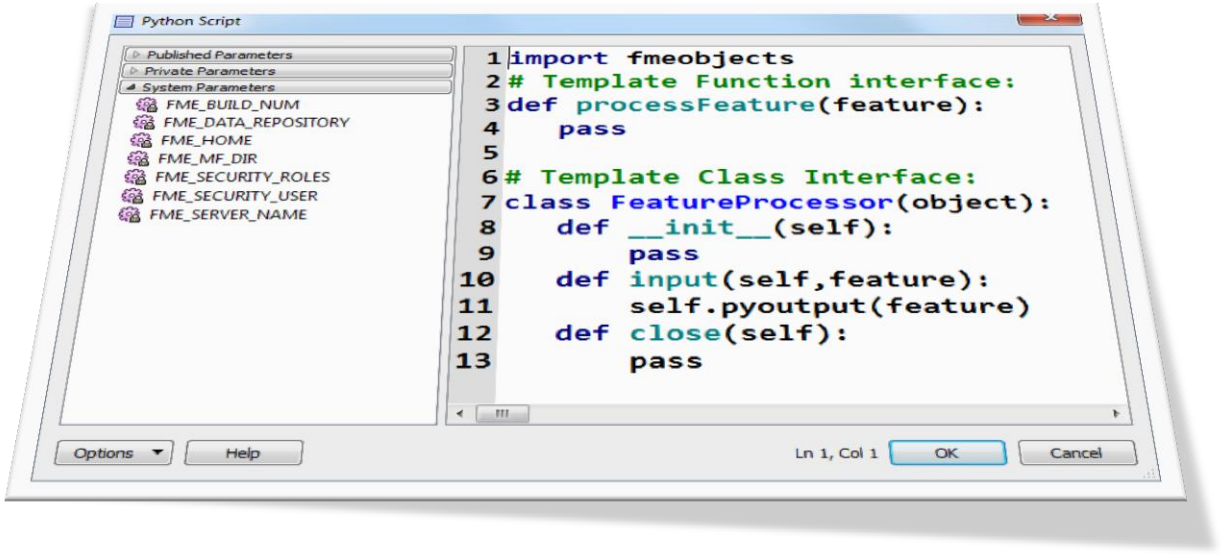
Agenda

- What is Python?
- FME and Python
- Best Practice



Poll: About You #2

- **Do you have any experience with Python?**

  > Yes, long time Python user
  > Yes, also within FME
  > Some
  > None

What is Python?

- Programming/Scripting Language
- Easy to learn and use, well documented
- Great user community
- Platform independent
- Great for GIS automatization tasks
- It‘s free!

- More details on www.python.org

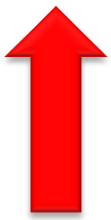
Python Basics

- **Variables (data-types)**
  > String, Integer, Float, List, Dictionary, Tuple
  > Dynamic typing
- **Built-In methods**
  > len(), max(), min(), …
- **Modules**
  > Thematic-grouped extensions
  > e.g. math, os, numpy, zip, re
- **IDEs**
  > IDLE, PyWin, PyDev for Eclipse, PyScripter, …

```
a=1 #integer
b='Hello, World!' #string
```

Sample #1

```
# Sample #1
# print even numbers from 1 to 9
a = range(1,10)                 # list from…to [excluded]
# for-loop
for i in a:
    if i%2 == 0:                # condition
        print 'number %i is even' %i
    else:
        print 'number %i is odd' %i
```



Line indentation is very important in Python!

FME and Python

- **Why and when should one make use of Python with FME Workbench?**

- **Want to do automatization tasks?**

  > Call Workspace from your Python script

- **Missing the right transformer?**

  > Write a few lines of python code in PythonCaller

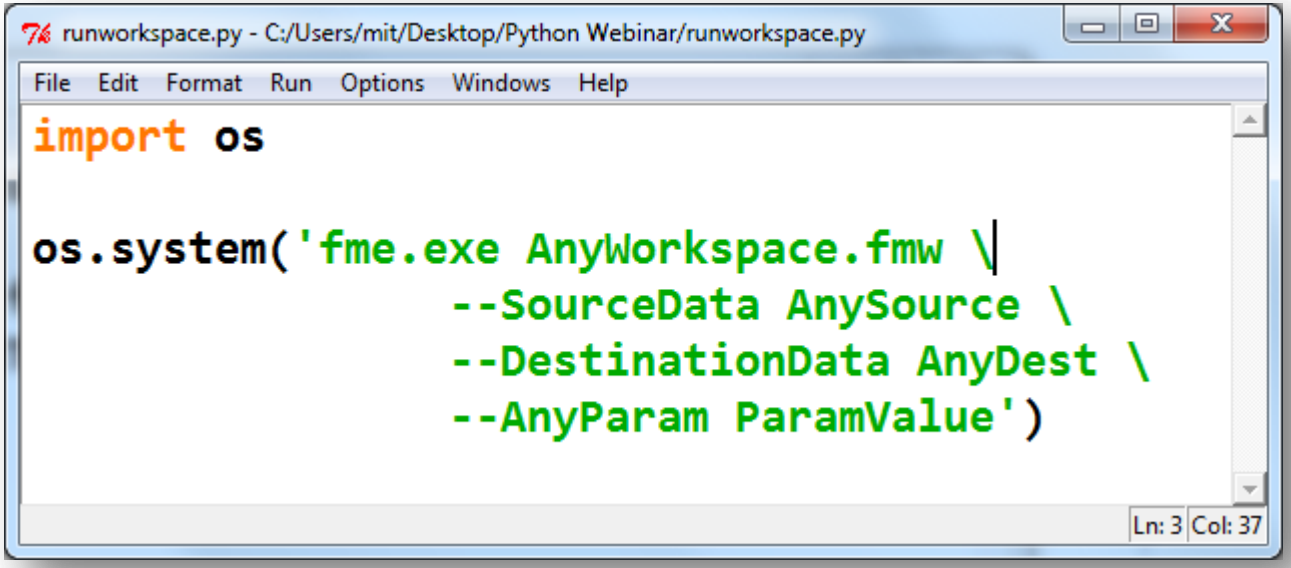
- **Want to carry out tasks before or after translation automatically?**

  > Use Python Startup or Shutdown Scripts

- **ALWAYS look for an existing FME Transformer or functionality first!**

Sample #2

- **Run FME Workspaces from a Python script (IDLE)**



Python in FME Workbench

- **Startup Script**
- **Shutdown Script**
- **Transformer PythonCreator & PythonCaller**
- **Private Scripted Parameter**

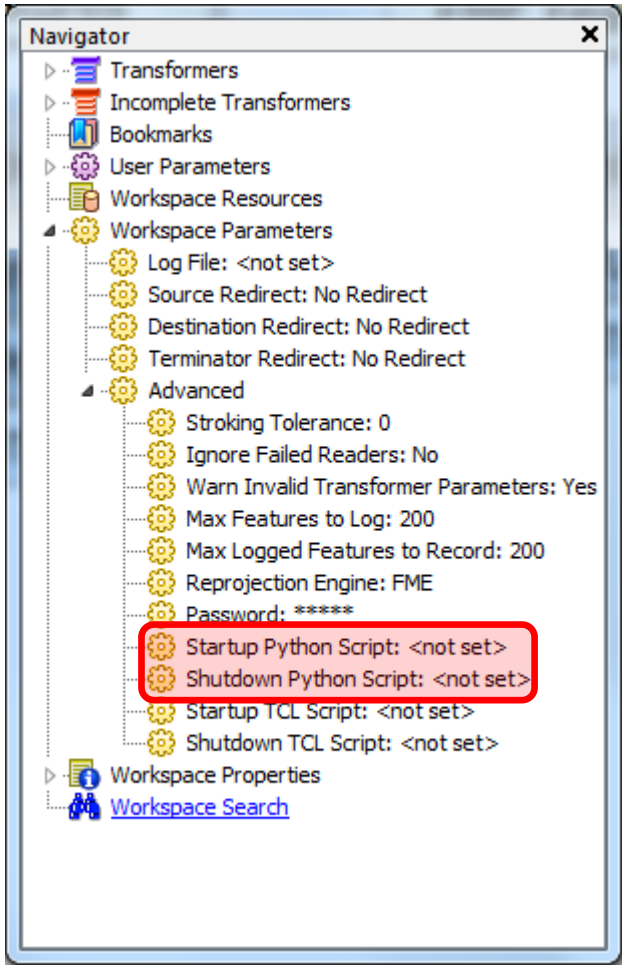
- ***Short Introduction into FME Objects API***

Startup Script

- **Executed prior the actual FME translation process**

- **Potential uses**
  - > Define your own Python functions
  - > Check database connectivity
  - > Move data or copy a template file
  - > Add your custom messages to Logfile
  - > Access any FME Macro Values:

```
FME_MacroValues['SourceDataset_ACAD']
```



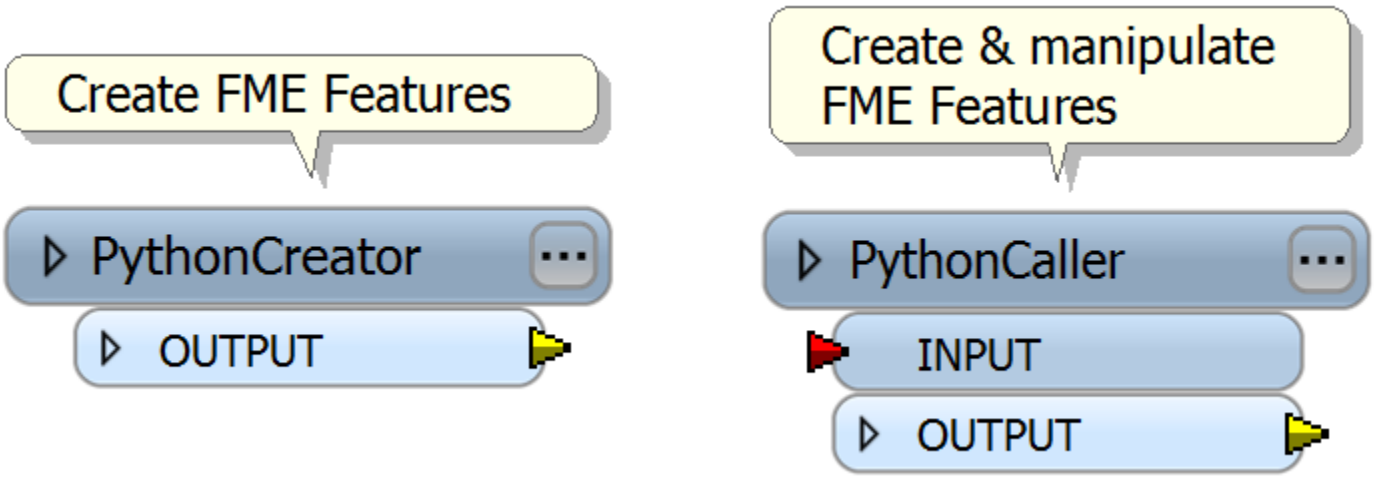
Shutdown Script

- **Executed after all Reader/ Writer work is done and process is finished either with SUCCESS or FAILURE**
- **Potential use**
  - > Any kind of post processing (e.g. calling ArcGIS scripting through ArcPy)
  - > Accessing statistical information about translation
  - > Copy result files
  - > Send an Success/ Failure email

- **Sample #3**

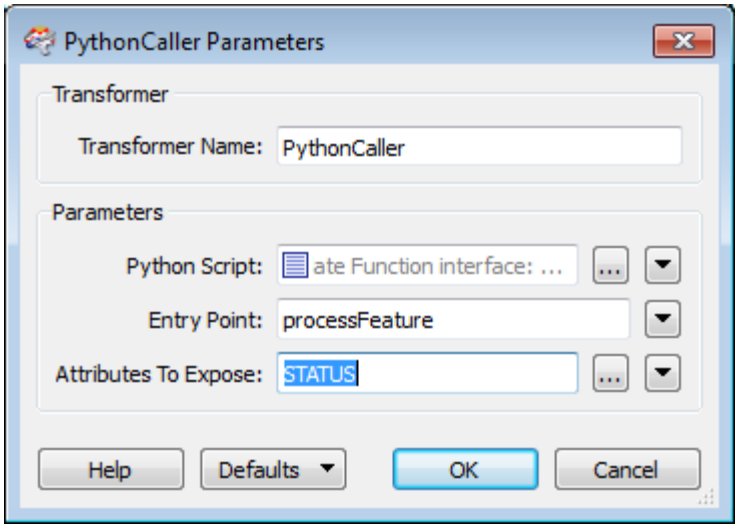
PythonCreator & PythonCaller

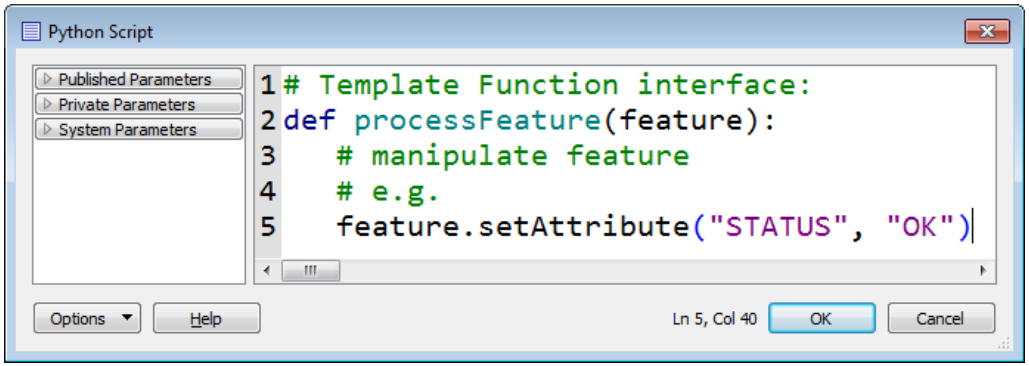
- **Both Transformers can execute Python scripts to manipulate or create FME Features.**



PythonCreator & PythonCaller

- **Parameters**
  - > Python Script
  - > Entry Point
  - > Attributes To Expose (opt)





Function

- **Using a Function (per-feature-manipulation)**

  > The function gets called for every feature passing the Transformer.
- **PythonCaller only**

```
# Template Function interface:
def processFeature(feature):
      # manipulate feature
      feature.buffer(10.0)
      feature.setAttribute("STATUS", "Buffered")
```

Class

- **Class: Allows to manipulate a group of features and create new features.**
- **PythonCaller and PythonCreator**

```
class MyClass(object):
    def __init__(self):
        # Constructor is called only once
    def input(self,feature):
        # input() is called for every feature passing
        # self.pyoutput() can be called in input() to
        # output the processed feature
        self.pyoutput(feature)
    def close(self):
        # close is called only once when the last feature has been
        # processed in input().
        # self.pyoutput() can be called to output new features.
        self.pyoutput(newFeature)
```

FMEObjects module

- **Python API to access FME functionality**
  - > FMEFeature()
  - > FMEGeometry()
  - > FMELogFile()
  - > ...
- **Documentation**
  - > %FME_Home%\help\python\apidoc
  - > %FME_Home%\fmeobjects\python\apidoc (more detailed) -> Requires installation of SDK

Sample #4

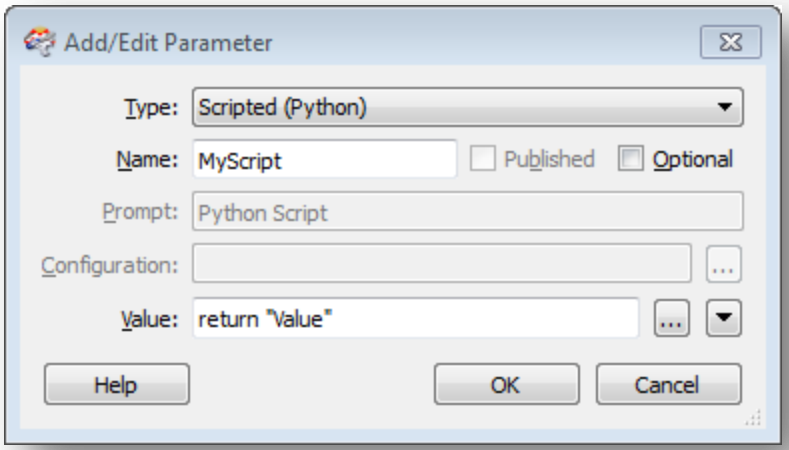
- **Python Olympics**

Private Scripted Parameter

- **Python script for assigning the value of a parameter to the workspace at runtime.**
- **An additional type of User Parameter**
- **Usage**

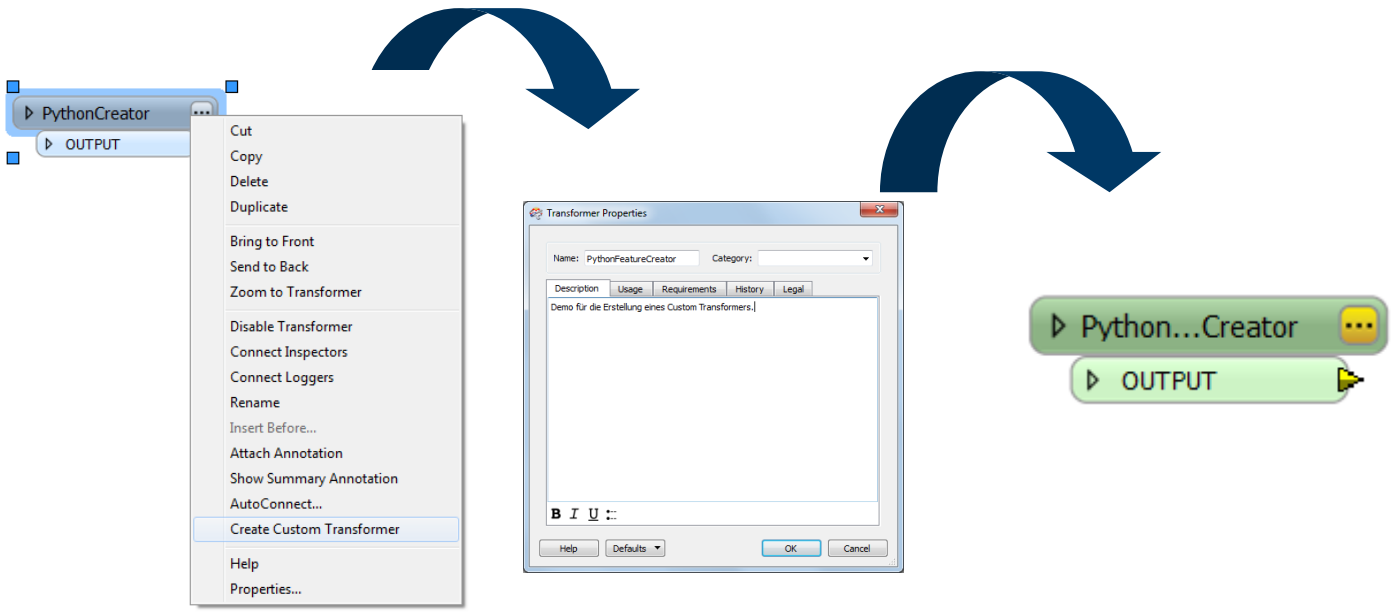
  > Hide (complex) functionality

- **Sample #5**



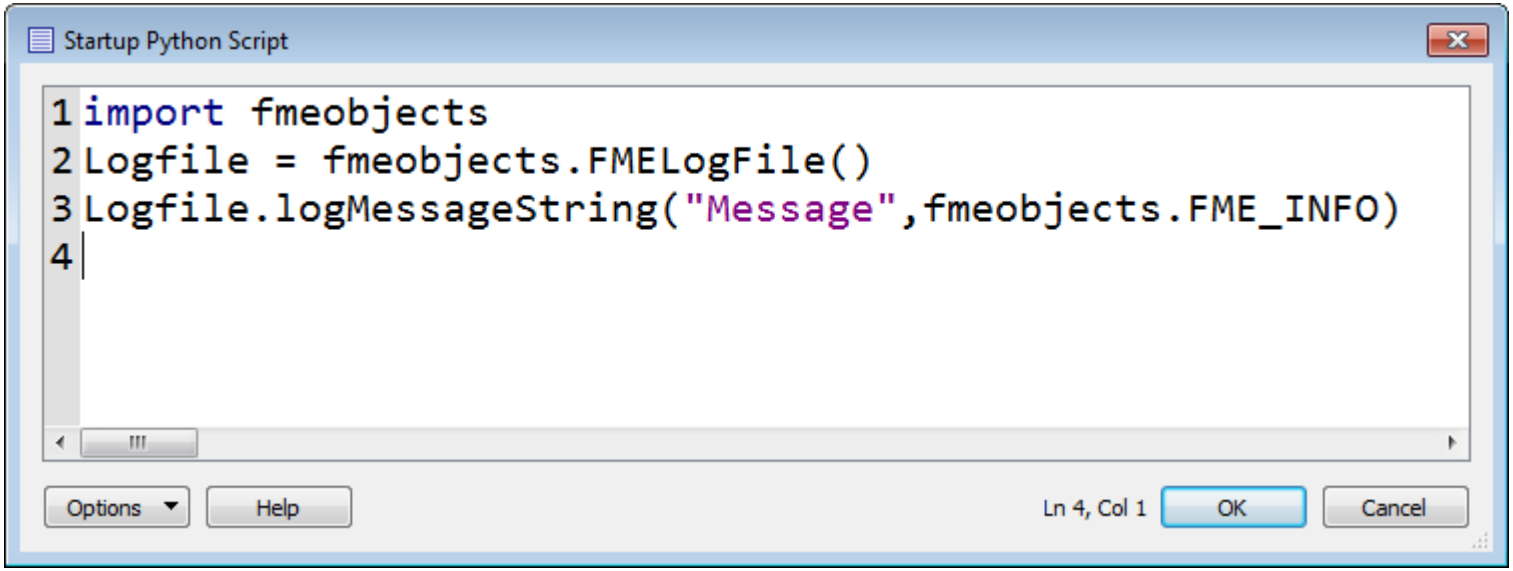
Best Practice I

- **Custom Transformer**
  > Create Custom Transformer from PythonCreator or PythonCaller to extend your Transformer Gallery



Best Practice II

- Use FME logging instead of print() statements
- Choose Severity Level (Info, Warn, Error, …)
- Messages are included into written Logfile



Documentation

- **FME Workbench Transformer Description**
- **Help -> Workbench Help**
- **FME Store (e.g. FuzzyStringComparer)**
- **FMEpedia**
  > Example-scripts-for-deleting-Excel-files-prior-to-writing
  > Python-and-FME-Basics
  > What-is-Python-and-How-Can-I-Install-It

The Road ahead

- **Python begin and end transformers**
- **Allow creation of input and output ports with PythonCaller transformer**
- **Using Python in place of TCL in FME transformers where performance would benefit**
- **Return more than one parameter from a Scripted Parameter**
- **Python Plug-In SDK**

  > allow ability to create transformers using Python plugin SDK

  > more samples and documentation for Python Plugin SDK

Priority on YOUR request and feedback!

Poll #3

- **Are you interested in an online FME & Python training course?**

  > Yes, absolutely
  > Maybe
  > No, thanks

What's Next?

- See FME 2012 on the FME World Tour: http://fme.ly/2012tour
- Read our latest newsletter www.safe.com/newsletter
- Download FME 2012: www.safe.com/downloads

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Thank you!

- **Questions about Python and FME?**
- **Interested in FME Training?**
  - > Basic and Advanced trainings
  - > On-site training
  - > FME Certified Trainers + Professionals

- **Send an email to fme@conterra.de**

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