py2eviews: Python + EViews

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Introduction

The purpose of the **py2eviews** package is to make it easier for EViews and Python to talk to each other, so Python programmers can use the econometric engine of EViews directly from Python. The Python package we've written uses COM to transfer data between Python and EViews. (For more information on COM and EViews, take a look at our whitepaper on the subject.) This package is only available for Windows users as it requires EViews to be properly installed and licensed on the same machine.

Note: Our older 'pyeviews' package is no longer being updated. This new package supersedes that older package and is more compatible with the latest versions of pandas. For users of the older package, please install and use py2eviews instead.

Example

Here's a simple example going from Python to EViews. We're going to use the popular Chow-Lin interpolation routine in EViews using data created in Python. Chow-Lin interpolation is a regression-based technique to transform low-frequency data (in our example, annual) into higher-frequency data (in our example, quarterly). It has the ability to use a higher-frequency series as a pattern for the interpolated series to follow. The quarterly interpolated series is chosen to match the annual benchmark series in one of four ways: first (the first quarter value of the interpolated series matches the annual series), last (same, but for the fourth quarter value), sum (the sum of the first through fourth quarters matches the annual series), and average (the average of the first through fourth quarters matches the annual series).

We're going to create two series in Python using the time series functionality of the **pandas** package, transfer it to EViews, perform Chow-Lin interpolation on our series, and bring it back into Python. The data are taken from Bloem *et al* in an example originally meant for Denton interpolation.

Installing py2eviews package

In your python environment, install the py2eviews package by running:

```
pip install py2eviews
```

If you're running python under a Miniforge or Anaconda distribution, run this instead:

```
conda install eviews::py2eviews
```

Preparing the data

In Python, create two time series using pandas. We'll call the annual series "benchmark" and the quarterly series "indicator":

```
import numpy as np

import pandas as pa
```

```
dtsa = pa.date_range('1998', periods = 3, freq = 'A')

benchmark = pa.Series([4000.,4161.4,np.nan], index=dtsa, name =
'benchmark')

dtsq = pa.date_range('1998q1', periods = 12, freq = 'Q')

indicator = pa.Series([98.2, 100.8, 102.2, 100.8, 99., 101.6, 102.7,
101.5, 100.5, 103., 103.5, 101.5], index = dtsq, name = 'indicator')
```

Pushing data to EViews

Import the **py2eviews** package and get an EViews app object by calling **GetEViewsApp**. Calling this method with *instance='new'* will result in launching a new instance of EViews. Setting *showwindow=True* will make the EViews application window visible (by default this is hidden).

```
import py2eviews as evp

eviewsapp = evp.GetEViewsApp(instance='new', showwindow=True)
```

Then call the **PutPythonAsWF** function to push both benchmark & indicator to EViews (into a single new workfile, but with two different pages):

```
evp.PutPythonAsWF(benchmark, app=eviewsapp)

evp.PutPythonAsWF(indicator, app=eviewsapp, newwf=False)
```

Behind the scenes, **PutPythonAsWF** will detect the DatetimeIndex of your **pandas** object (if you have one) and adjust it to match EViews' date requirements. Since EViews assigns dates to be the beginning of a given period depending on the frequency, this can lead to misalignment issues and unexpected results when calculations are performed. For example, a DatetimeIndex with an annual 'YE' frequency and a date of 2000-12-31 will be assigned an internal EViews date of 2000-12-01. In this case, the **PutPythonAsWF** method will adjust the date to 2000-01-01 before pushing it to EViews.

Running EViews commands:

EViews commands can also be run using the **Run** method. We'll use it here to rename the two page names that were just created.

```
evp.Run('pageselect Untitled', app=eviewsapp)

evp.Run('pagerename Untitled annual', app=eviewsapp)

evp.Run('pageselect Untitled1', app=eviewsapp)

evp.Run('pagerename Untitled1 quarterly', app=eviewsapp)
```

Perform the Chowlin interpolcation

We'll run the EViews "copy" command to copy the benchmark series (in the annual page) to a new object on the quarterly page, while using the indicator series already in the quarterly page as the high-frequency indicator and matching the sum of the benchmarked series for each year (four quarters) with the matching annual value of the benchmark series:

```
evp.Run('copy(rho=.7, c=chowlins, overwrite) annual\\benchmark
quarterly\\benchmarked @indicator indicator', app=eviewsapp)
```

Pulling data from EViews

Now that EViews has calculated the new benchmark quarterly series, we'll bring it into Python using the **`GetWFAsPython`** method:

```
benchmarked = evp.GetWFAsPython(app=eviewsapp, pagename= 'quarterly',
namefilter= 'benchmarked ')

print benchmarked
```

```
               BENCHMARKED
   1998-01-01   867.421429
   1998-04-01  1017.292857
   1998-07-01  1097.992857
   1998-10-01  1017.292857
   1999-01-01   913.535714
   1999-04-01  1063.407143
   1999-07-01  1126.814286
   1999-10-01  1057.642857
   2000-01-01  1000.000000
   2000-04-01  1144.107143
   2000-07-01  1172.928571
   2000-10-011057.642857
```

Cleaning up

Now that we're done using the EViews application, we can release it by hiding the application window and then setting our local eviewsapp variable to None. A final call to Cleanup will release any variables used by py2eviews:

```
eviewsapp.Hide()

eviewsapp = None

evp.Cleanup()
```

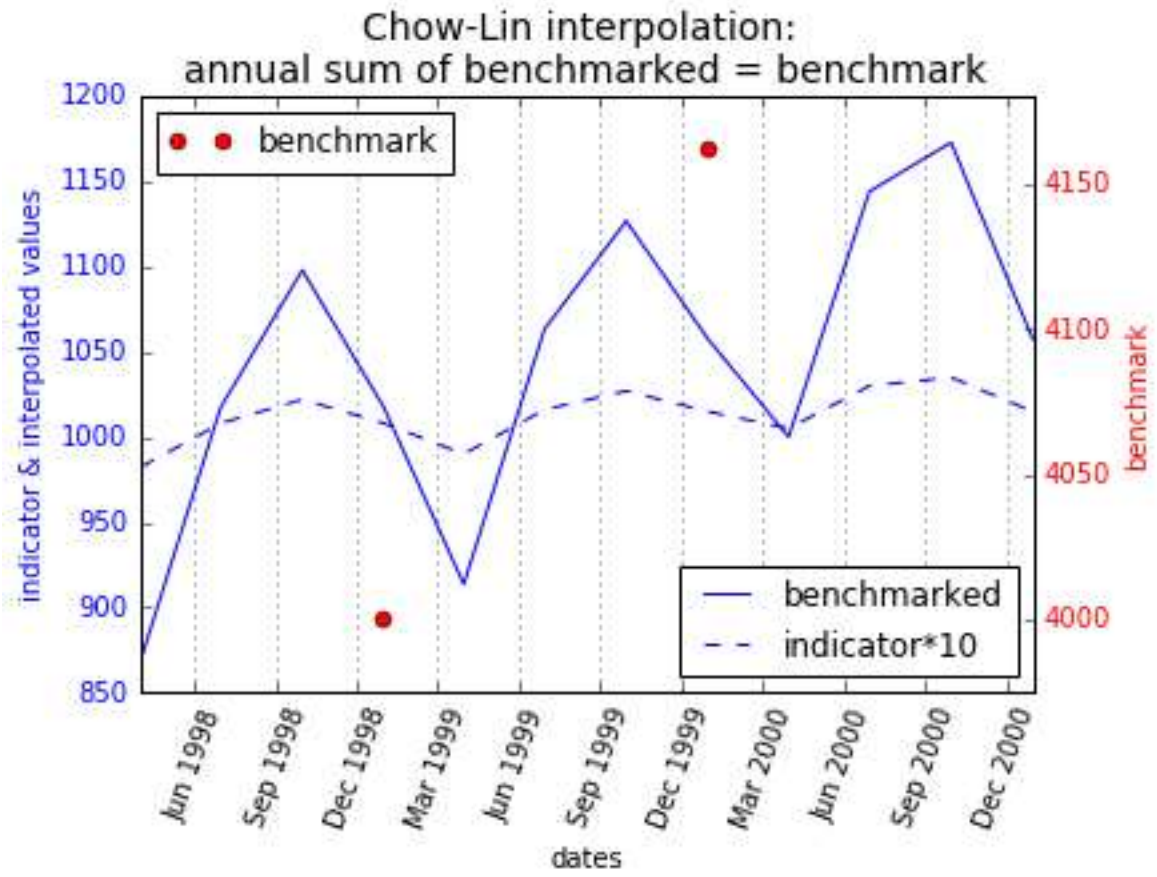
Note: If you happen to set `eviewsapp = None` while the EViews application window is still visible, EViews will continue to run. EViews will only shutdown automatically if it is not visible. If you do happen to leave EViews open at the end of your program, you'll have to manually quit EViews.

Plotting the new quarterly benchmark series against the indicator series

As an optional step, we can plot everything to see how the interpolated series follows the indicator series (this requires you have the matplotlib package installed):

```
# load the matplotlib package to plot

import matplotlib.pyplot as plt
```

```
# reindex the benchmarked series to the end of the quarter so the dates
   match those of the indicator series

benchmarked_reindexed = pa.Series(benchmarked.values.flatten(), index =
   benchmarked.index + pa.DateOffset(months = 3, days = -1))

# plot

fig, ax1 = plt.subplots()

plt.xticks(rotation=70)

ax1.plot(benchmarked_reindexed, 'b-', label='benchmarked')

# multiply the indicator series by 10 to put it on the same scale as
   the benchmarked series

ax1.plot(indicator*10, 'b--', label='indicator*10')

ax1.set_xlabel('dates')

ax1.set_ylabel('indicator & interpolated values', color='b')

ax1.xaxis.grid(True)

for tl in ax1.get_yticklabels():

    tl.set_color('b')

plt.legend(loc='lower right')

ax2 = ax1.twinx()

ax2.set_ylim([3975, 4180])

ax2.plot(benchmark, 'ro', label='benchmark')

ax2.set_ylabel('benchmark', color='r')

for tl in ax2.get_yticklabels():

    tl.set_color('r')

plt.legend(loc='upper left')

plt.title("Chow-Lin interpolation: \nannual sum of benchmarked =
   benchmark", fontsize=14)

plt.show()
```



References

Bloem, A.M, Dippelsman, R.J. and Maehle, N.O. 2001 Quarterly National

Accounts Manual–Concepts, Data Sources, and Compilation.
IMF. http://www.imf.org/external/pubs/ft/qna/2000/Textbook/index.htm

List of Functions

Public:

py2eviews.GetEViewsApp(version='EViews.Manager', instance='either', showwindow=False)

Define a custom EViews COM application object with specified options.

Parameters:

version: {'EViews.Manager', 'EViews.Manager.14', 'EViews.Manager.13', 'EViews.Manager.12'}, optional

Select the version of EViews to be used. 'EViews.Manager' will use the last registered version of EViews, 'EViews.Manager.14' will explicitly use version 14, etc.

instance: {'new', 'either', 'existing'}, optional

The instance type for the EViews COM application. 'new' opens a new EVIews application, 'either' uses an existing application, or, if none exists, opens a new one, and 'existing' uses an existing application.

showwindow: bool, optional

Display the EViews window.

Returns:

out: EViews COM application

A user-defined COM application object.

py2eviews.PutPythonAsWF(object, app=None, newwf=True)

Determine the type of object and push into EViews with specified options. Calls _BuildFromPython or _BuildFromPandas.

Parameters:

object: pandas DataFrame, Series, MultiIndex, DatetimeIndex, or RangeIndex; list, dict, or numpy array

The Python or pandas object to be pushed into EViews.

app: EViews COM application, optional

COM application object

newwf: bool, optional

If False, creates a new page in an already existing workfile or a new workfile if none exists.

Returns:

out: EViews series, panel, or an empty workfile with the appropriate Range set (for a pandas Index)

Pandas Series and DataFrame attributes are automatically copied into EViews series attributes.

py2eviews.GetWFAsPython(app=None, wfname='', pagename ='', namefilter='*')

Pull data from EViews into Python with specified options.

Parameters:

app: EViews COM application, optional

A user-defined COM application object.

wfname: string, optional

Name of the EViews workfile to pull data from. Must be the full path name. If no workfile is specified the currently open workfile will be used.

pagename: string, optional

Name of the EViews workfile page to be created.

namefilter: string, optional

Base name for series to be pulled.

Returns:

out: pandas DataFrame

A pandas DataFrame containing the series objects pulled from EViews. EViews series attributes are automatically copied into the attributes of the DataFrame.

py2eviews.Run(command, app=None)

Run an EViews command directly from Python.

Parameters:

command: string

The full command to be passed to EViews.

app: EViews COM application, optional

A user-defined COM application object.

py2eviews.Get(objname, app=None)

Return single data values from an EViews workfile.

Parameters:

objname: string

A single piece of EViews data (e.g. a scalar value or string value such as "@pagename."

app: EViews COM application, optional

A user-defined COM application object.

Returns:

out: string

py2eviews.Cleanup(app=None)

Clear the memory allocated to the COM process. This is not done automatically in interactive mode.

Parameters:

app: EViews COM application, optional

COM application object with memory to be released. If no app is specified the global app is substituted.

Private:

py2eviews._BuildFromPython(objectlength, newwf=True)

Creates the CREATE or PAGECREATE command for a new compatible EViews workfile.

Parameters:

objectlength: integer

The length of the Python object (list, dict, or numpy array) to be pushed to EViews.

newwf: bool, optional

If False, creates a new page in an already existing workfile or a new workfile if none exists.

Returns:

out: string

A string with the create command for a workfile or page.

py2eviews._BuildFromPandas(object, newwf=True)

Creates the CREATE or PAGECREATE command for a new compatible EViews workfile.

Parameters:

object: pandas object

The Python pandas object (series, dataframe, panel, or DatetimeIndex) to be pushed to EViews.

newwf: bool, optional

If False, creates a new page in an already existing workfile or a new workfile if none exists.

Returns:

out: string

A string with the create command for a workfile or page.

py2eviews._CheckReservedNames(names)

Check that none of the data structure names being pushed to EViews are the reserved names "c" or "resid."

Parameters:

names: list of object names

py2eviews._GetApp(app=None)

Determine the use of either the user-defined EViews COM application object or the global application object.

Parameters:

app: EViews COM application, optional

COM application object

Returns:

app: EViews COM application

COM application object

Frequency conversions

Python pandas frequency	EViews frequency
AS, A, YE, YS, Y, BAS, BA *	A
QS, Q, BQS, BQ	Q
MS, M, BMS, BM, CBMS, CBM	M
W	W
D	D7
B	D5
C	D(*day begin, day end*)
H, BH *	H(*day begin-day end, time min-time max*)
T, min *	Min(*day begin-day end, time min-time max*)
S *	Sec(*day begin-day end, time min-time max*)
L, ms, U, us, N	Not supported

* = Includes custom frequencies (2A, 6H, 5min, 30S, etc). See EViews documentation for full list.