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1 What is this document?

This is really just a PDF version of `INSTALL.txt` which you'll find in the ToPy zip file.

2 Where to get ToPy

If you're reading this, you most probably have it already. But here's the URL in any case:

`code.google.com/p/topy`.

At the URL above, go to the Downloads tab and download the zip file corresponding to the version number below under requirements. Unzip and follow the instructions in `INSTALL.txt` or this document.

ToPy was last tested and worked on Windows 7.

ToPy was originally developed on GNU/Linux (Ubuntu).

3 ToPy requirements

The following is copied (included, actually) verbatim from `INSTALL.txt`:

ToPy-0.1.1 installation instructions (2012).

PLEASE read through the following carefully.

```
=====
=== ToPy requirements ===
=====
```

The following is ALL for Win 32-bit, I haven't tested ToPy with the 64-bit equivalents. I tested against the versions in the round brackets.

I would still suggest to run ToPy on a modern GNU/Linux distribution, as installing and compiling things are just that much easier.

1) Python (v2.7.1) {>= v2.5 should also work}

2) Third party software (make sure it's for Python 2.7):

- ```

```
- a) NumPy (v1.6.1) [[sourceforge.net/projects/numpy/files/NumPy/1.6.1/](http://sourceforge.net/projects/numpy/files/NumPy/1.6.1/)]  
If on Windows and you want to use the binary PySparse given below under (e), then go here: <http://www.lfd.uci.edu/~gohlke/pythonlibs/>  
Download the numpy-MKL installer under NumPy.
  - b) Matplotlib (v1.1.0) [[matplotlib.sourceforge.net](http://matplotlib.sourceforge.net)]
  - c) SymPy (v0.7.1) [<http://code.google.com/p/sympy/>]
  - d) PyVTK (latest) [[cens.ioc.ee/projects/pyvtk](http://cens.ioc.ee/projects/pyvtk), under Download]  
It's been moved to Google Code, but it's still available from the URL above. The actual version I tested against is v0.4.74.
  - e) PySparse (v1.1.1) [[pysparse.sourceforge.net](http://pysparse.sourceforge.net)]  
You have to build PySparse from source, which can be a slight hassle on Windows...  
Fortunately, there's a binary here (look under PySparse):  
<http://www.lfd.uci.edu/~gohlke/pythonlibs/>

3) To view 3D results and to create animations:

- ```
-----
```
- a) ParaView or MayaVi [www.paraview.org] or [mayavi.sourceforge.net]
 - b) ImageMagick (to convert PNG's to GIF's) [www.imagemagick.org]

```
=====
=== Installation ===
=====
```

Install at least all the requirements listed under point 2 above, in that order.

Then unzip the ToPy zip file. You have two options for installation:

Option 1:

Then do the usual (in a terminal/console):

```
python setup.py install
```

Note: The examples are not copied to the installation folder, you can access them in the extracted archive folder.

Option 2:

Just copy the entire 'topy' folder to the 'site-packages' folder in your Python installation. You can also copy it to another location that is visible to Python.

=====

=== Using ToPy ===

=====

Go to the 'examples' directory and read the README.txt file.

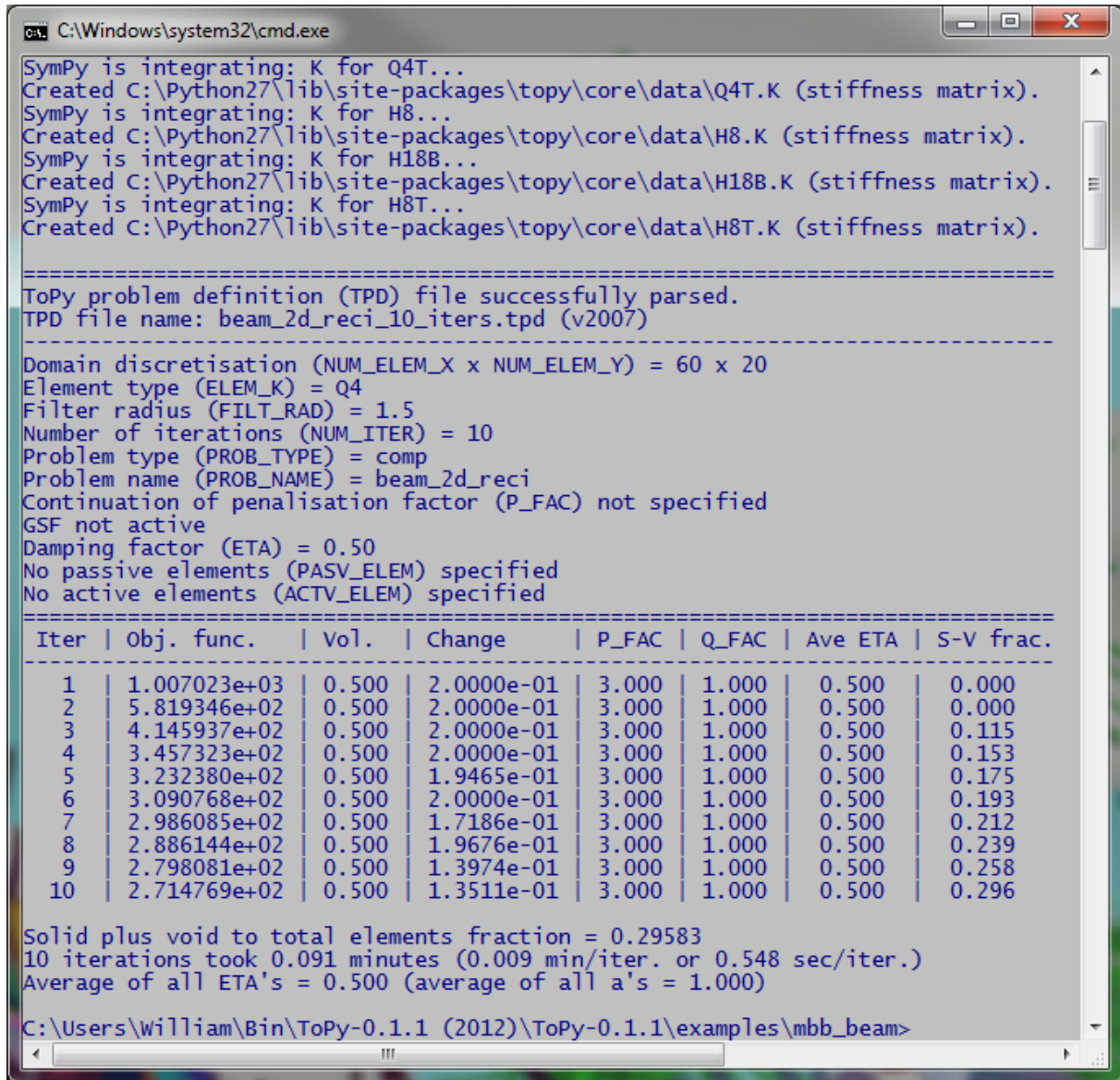
The first time you use ToPy it might be slow, because it has to create stiffness matrices, which involves symbolic integration. Once it's done though, the subsequent runs will be fast. You can also create the matrices manually by typing

```
python recreate_all.py
```

in a terminal/console in the 'data' directory.

4 Sample ToPy terminal/console output

In case you don't believe me...



The screenshot shows a Windows command prompt window titled "C:\Windows\system32\cmd.exe". The output text is as follows:

```
SymPy is integrating: K for Q4T...
Created C:\Python27\lib\site-packages\topy\core\data\Q4T.K (stiffness matrix).
SymPy is integrating: K for H8...
Created C:\Python27\lib\site-packages\topy\core\data\H8.K (stiffness matrix).
SymPy is integrating: K for H18B...
Created C:\Python27\lib\site-packages\topy\core\data\H18B.K (stiffness matrix).
SymPy is integrating: K for H8T...
Created C:\Python27\lib\site-packages\topy\core\data\H8T.K (stiffness matrix).

=====
ToPy problem definition (TPD) file successfully parsed.
TPD file name: beam_2d_reci_10_iters.tpd (v2007)
=====

Domain discretisation (NUM_ELEM_X x NUM_ELEM_Y) = 60 x 20
Element type (ELEM_K) = Q4
Filter radius (FILT_RAD) = 1.5
Number of iterations (NUM_ITER) = 10
Problem type (PROB_TYPE) = comp
Problem name (PROB_NAME) = beam_2d_reci
Continuation of penalisation factor (P_FAC) not specified
GSF not active
Damping factor (ETA) = 0.50
No passive elements (PASV_ELEM) specified
No active elements (ACTV_ELEM) specified

=====
  Iter | Obj. func. | Vol. | Change | P_FAC | Q_FAC | Ave ETA | S-V frac.
=====
    1 | 1.007023e+03 | 0.500 | 2.0000e-01 | 3.000 | 1.000 | 0.500 | 0.000
    2 | 5.819346e+02 | 0.500 | 2.0000e-01 | 3.000 | 1.000 | 0.500 | 0.000
    3 | 4.145937e+02 | 0.500 | 2.0000e-01 | 3.000 | 1.000 | 0.500 | 0.115
    4 | 3.457323e+02 | 0.500 | 2.0000e-01 | 3.000 | 1.000 | 0.500 | 0.153
    5 | 3.232380e+02 | 0.500 | 1.9465e-01 | 3.000 | 1.000 | 0.500 | 0.175
    6 | 3.090768e+02 | 0.500 | 2.0000e-01 | 3.000 | 1.000 | 0.500 | 0.193
    7 | 2.986085e+02 | 0.500 | 1.7186e-01 | 3.000 | 1.000 | 0.500 | 0.212
    8 | 2.886144e+02 | 0.500 | 1.9676e-01 | 3.000 | 1.000 | 0.500 | 0.239
    9 | 2.798081e+02 | 0.500 | 1.3974e-01 | 3.000 | 1.000 | 0.500 | 0.258
   10 | 2.714769e+02 | 0.500 | 1.3511e-01 | 3.000 | 1.000 | 0.500 | 0.296
=====

Solid plus void to total elements fraction = 0.29583
10 iterations took 0.091 minutes (0.009 min/iter. or 0.548 sec/iter.)
Average of all ETA's = 0.500 (average of all a's = 1.000)

C:\Users\William\Bin\ToPy-0.1.1 (2012)\ToPy-0.1.1\examples\mbb_beam>
```

—
William Hunter
2012-03-04