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PROBLEM 0: NUMPY AND PYLAB : 5.0 POINTS

To create plots for Problem 5 of this assignment, you will need the Python library packages Matplotlib (Pylab) and NumPy. If you downloaded Enthought in Problem Set 1 (/courses/MITx/6.00x/2012_Fall/courseware/Week_1/Problem_Set_1/), you should already have these packages installed.

To test that you have successfully installed matplotlib and numpy, open the file `run_pkgtest.py` and run it. A graph should appear after a short pause (it may take a few minutes, depending on the speed of your machine); when it does, please answer the questions at the bottom of this page related to the graph's appearance.

Note: You can use the save button on the Pylab figure to save as .pdf; this is useful if you wish to examine plots you produce later, without having to re-run your code.

If you see an error such as:

```
Traceback (most recent call last):
  File "C:/Users/winedx9/Desktop/run_pkgtest.py", line 1, in <module>
    import ps7_pkgtest
  File "ps7_pkgtest.py", line 2, in <module>
    ImportError: No module named numpy
```

and/or

```
Traceback (most recent call last):
  File "C:/Users/winedx9/Desktop/run_pkgtest.py", line 1, in <module>
    import ps7_pkgtest
  File "ps7_pkgtest.py", line 3, in <module>
    ImportError: No module named pylab
```

then you do **not** have the required packages installed. Read on for more support.

- If you **do** have Enthought installed, be sure the top of your IDLE interpreter says something like `Python 2.7.3 |EPD_free 7.3-2 (32-bit)`. If it doesn't say anything about EPD_free, you are not running the IDLE interpreter from the Enthought distribution. Find the Enthought folder on your system and choose IDLE from within the Enthought folder.
- If you **did not** install Enthought, you can attempt to install the correct packages on your own. Note that the 6.00x staff will not be able to help you install these packages. If you have trouble, we strongly recommend you simply install Enthought. That said, here are the packages you need to have. Choose which set of instructions to follow based on which OS and version of Python you are running. You only need the one of each library that matches your setup!

Note on 32 bit v 64 bit

* Note: The installers presented in this section are all 32-bit installers. If this means nothing to you then disregard this message. However, for those of you who know you have 64-bit systems and 64-bit Python, please visit the actual matplotlib (<http://sourceforge.net/projects/matplotlib/files/matplotlib/matplotlib-1.1.0/>) and numpy (<http://sourceforge.net/projects/numpy/files/NumPy/1.6.1/>) download sites for the 64-bit installers.

OS X

Python 2.7

- matplotlib 1.1.0 for Python 2.7 (<http://sourceforge.net/projects/matplotlib/files/matplotlib/matplotlib-1.1.0/matplotlib-1.1.0-py2.7-python.org-macosx10.3.dmg/download>)
- numpy 1.6.1 for Python 2.7 (<http://sourceforge.net/projects/numpy/files/NumPy/1.6.1/numpy-1.6.1-py2.7-python.org-macosx10.3.dmg/download>)

Python 2.6

- matplotlib 1.1.0 for Python 2.6 (<http://sourceforge.net/projects/matplotlib/files/matplotlib/matplotlib-1.1.0/matplotlib-1.1.0-py2.6-python.org-macosx10.3.dmg/download>)
- numpy 1.6.1 for Python 2.6 (<http://sourceforge.net/projects/numpy/files/NumPy/1.6.1/numpy-1.6.1-py2.6-python.org-macosx10.3.dmg/download>)

Windows

Python 2.7

- matplotlib 1.1.0 for Python 2.7 (<http://sourceforge.net/projects/matplotlib/files/matplotlib/matplotlib-1.1.0/matplotlib-1.1.0.win32-py2.7.exe/download>)
- numpy 1.6.1 for Python 2.7 (<http://sourceforge.net/projects/numpy/files/NumPy/1.6.1/numpy-1.6.1-win32-superpack-python2.7.exe/download>)

Python 2.6

- matplotlib 1.1.0 for Python 2.6 (<http://sourceforge.net/projects/matplotlib/files/matplotlib/matplotlib-1.1.0/matplotlib-1.1.0.win32-py2.6.exe/download>)
- numpy 1.6.1 for Python 2.6 (<http://sourceforge.net/projects/numpy/files/NumPy/1.6.1/numpy-1.6.1-win32-superpack-python2.6.exe/download>)

Linux

Running the command:

```
$ sudo apt-get install python-matplotlib
```

in the terminal should install both packages for you. The files to install are also available at:

- matplotlib 1.1.0 for Python 2.7 and 2.6 (<http://sourceforge.net/projects/matplotlib/files/matplotlib/matplotlib-1.1.0/matplotlib-1.1.0.tar.gz/download>)
- numpy 1.6.1 for Python 2.7 and 2.6 (<http://sourceforge.net/projects/numpy/files/NumPy/1.6.1/numpy-1.6.1.tar.gz/download>)

Once the graph displays, you should be able to answer the following questions. Please note that spelling, spacing, and capitalization matter, so if you get it wrong (but it looks right), take a very close and careful look at each character in your answer.

1. What is the title of the graph?

2. What is the label on the x-axis of the graph?

3. What is the label on the y-axis of the graph?

PyLab links mentioned in lecture:

- http://matplotlib.org/api/pyplot_summary.html (http://matplotlib.org/api/pyplot_summary.html)
- http://www.scipy.org/Plotting_Tutorial (http://www.scipy.org/Plotting_Tutorial)
- <http://matplotlib.sourceforge.net/users/customizing.html>
(<http://matplotlib.sourceforge.net/users/customizing.html>)

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