Installing Python Program with ENTHOUGHT Canopy

Enthought canopy is a comprehensive Python Analysis Environment. Here is the instruction.

(1) Go to page https://www.enthought.com/products/canopy/
(2) Download Canopy by clicking ``Get Canopy“
(3) Open Canopy.
(4) Type the following three-line code in Canopy Command Prompt (IPython Prompt) to check if you successfully install it:

```
randn(100,2) # generate random numbers from the standard normal
y = mean(randn(100,100)) # compute mean
plot(y) # plot it
```

(5) References
Documents:
http://docs.enthought.com/canopy/index.html

Python anywhere IPython from your browser !
https://www.pythonanywhere.com/try-ipython/
Generate Random Sample and Statistics

### Discussion Section 1

```python
import numpy as np
import matplotlib.pyplot as plt

n = 450  # set n

x = np.random.normal(0, 1, n)  # 450, N(0, 1)
y = 1 - 2*x + np.random.normal(0, 1, n)

np.mean(x)  # compute mean
np.var(x)  # compute variance
np.median(x)  # compute median

np.cov(x, y)  # variance-covariance matrix
np.corrcoef(x, y)  # correlation matrix

f, axarr = plt.subplots(2, sharex=True)
n, bins, patches = axarr[0].hist(x, 16, normed=1, facecolor='b', alpha=0.6)
axarr[0].set_title('Histogram')
axarr[0].set_xlim((-4, 4))

A = np.vstack([np.ones(len(x)), x]).T  # set up matrix

a, b = np.linalg.lstsq(A, y)[0]  # least square estimates
print '(a, b) ='
print a, b

axarr[1].plot(x, y, 'o', label='Original data', markersize=3)  # scatter plot
axarr[1].plot(x, a + b*x, 'r', label='Fitted line')  # fitted line
axarr[1].legend()

plt.show()
```