Lab 9: Improve the runtime of the code below using boost::python

Due date: Thursday April 10, 11:59pm
The attached code plots a 2D graph of this function:

$$f(x,y) = \prod_{i=1}^{i=10} \sin x^{1/i} \ \cos y^{1/i}$$

Evaluate the runtime of the supplied code and improve it by coding the time-consuming part or parts in C++ using boost::python. Report the the graph generated by pure python and the graph generated by the hybrid C++/python, and also report the speed improvement (if any) of the C++ hybrid over the pure python solution.

```python
#!/usr/bin/env python
#
import matplotlib.pyplot as plt
import math
import time

def plot(mymap):
    fig = plt.figure()
    im = plt.imshow(mymap,cmap=plt.get_cmap('jet'), vmin=0, vmax=255)
    plt.show()

def calc(x,y):
    z = 0.0
    for i in xrange(1,11):
        z += math.sin(math.pow(x,1./i)) * math.cos(math.pow(y,1./i))
    return z

if __name__ == '__main__':
    output=[]
    start = time.time()
    for x in xrange(1000):
        line=[]
        for y in xrange(1000):
            nx = x/100.
            ny = y/100.
            z = calc(x,y) * 255
            line.append(z)
        output.append(line)
    end = time.time()
    print "Time elapsed",end-start
    plot(output)
```

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