SC 250 Fall 2012
Assignment Two

August 30, 2012

1 Task

Download and install `matplotlib` from `http://matplotlib.sourceforge.net`.

Convert the procedure that you wrote last time for calculating primes into a function. Define another function that counts the number of primes between 2 and a real number x. In mathematics, this function is called the *prime-counting function* and is denoted by $\pi(x)$. A famous theorem in mathematics asserts that

$$\pi(n) \approx \frac{n}{\ln(n)}.$$

Create a graph using the functions written above that compares $\pi(n)$ and $n/\ln(n)$ between 2 and some number above 50,000. The lines in the graph should be different colors.

2 Due Date

This assignment is due at class time on September 4. You should turn in a file containing your source code on OAK, including the definitions of the functions and the code used to generate the graph, as well as an image of the graph. This assignment is worth 10 points. It will be graded by running the program.

3 Suggestions

Pay attention to efficiency concerns - this assignment should not take an inordinate amount of time to run.

Python has a docstrings convention page for documenting functions at
`http://www.python.org/dev/peps/pep-0257/`.

Perhaps more importantly, scientific computing code (namely scipy and numpy) have docstring conventions. See
`https://github.com/numpy/numpy/blob/master/doc/HOWTO_DOCUMENT.rst.txt`.