Introduction to Signal Processing Practice Section

School of Information Science & Technology

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Needed Python Packages

SciPy:

- ✓ a collection of mathematical algorithms and convenience functions built on the Numpy extension of Python
- ✓ adds significant power to the interactive Python session
    - ✓ high-level commands and classes for manipulating and visualizing data]
- ✓ a data-processing and system-prototyping environment rivaling sytems such as MATLAB, IDL, Octave, R-Lab, and SciLab
- ✓ link to tutorials

  http://docs.scipy.org/doc/scipy/reference/tutorial/general.html
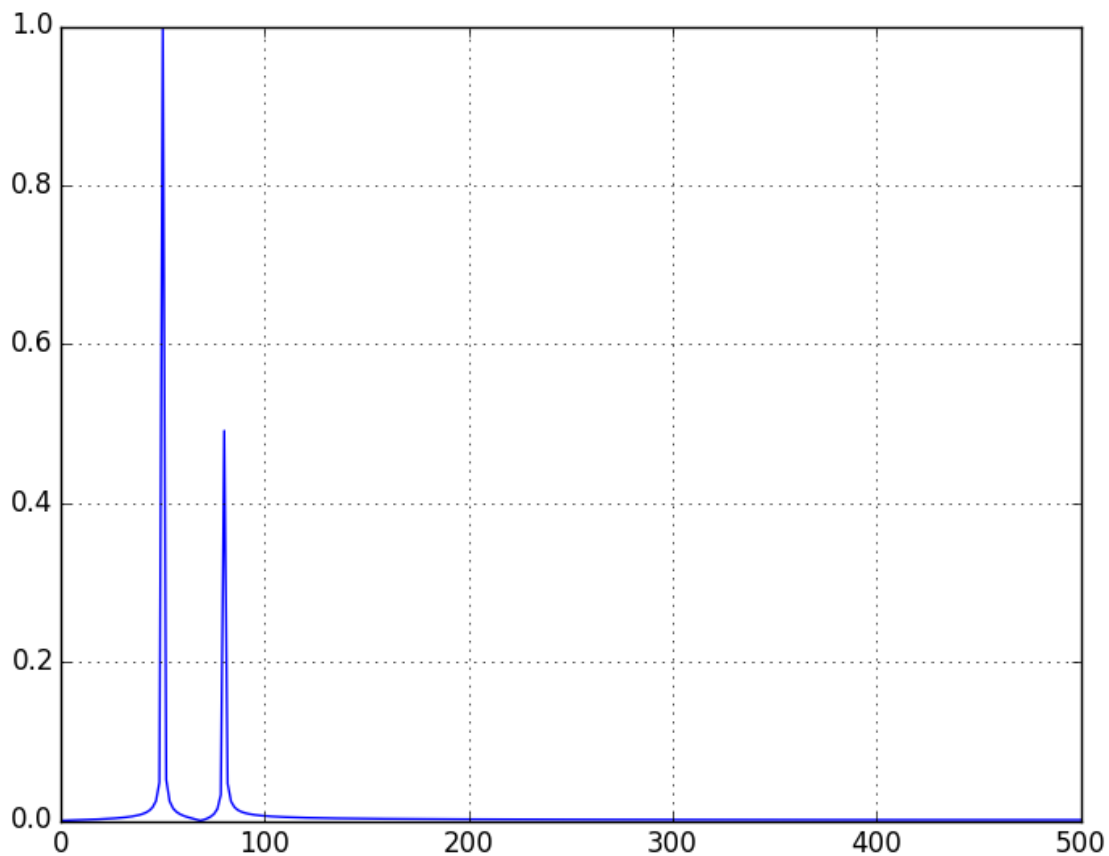
Matplotlib:

- ✓ matplotlib is a python 2D plotting library which produces publication quality figures in a variety of hardcopy formats and interactive environments across platforms.

Numpy:

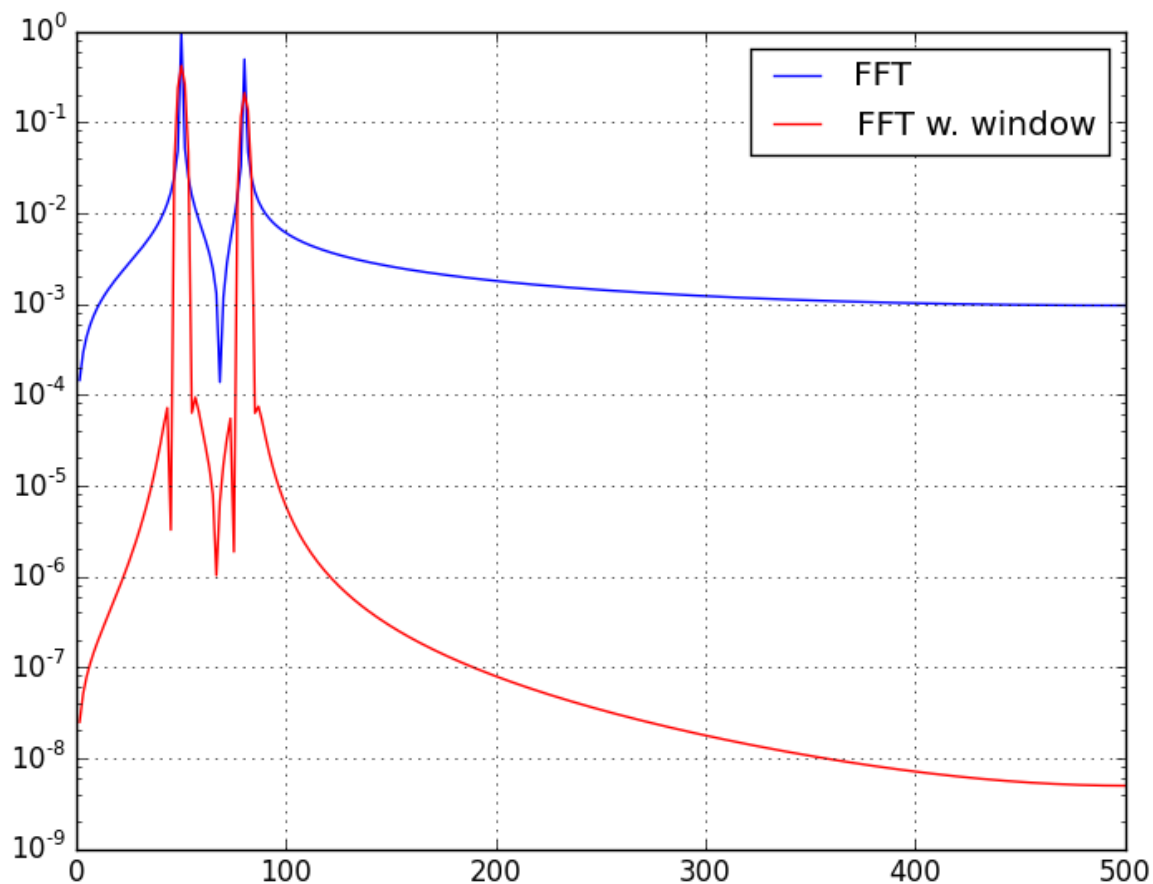- ✓ NumPy is the fundamental package for scientific computing with Python.
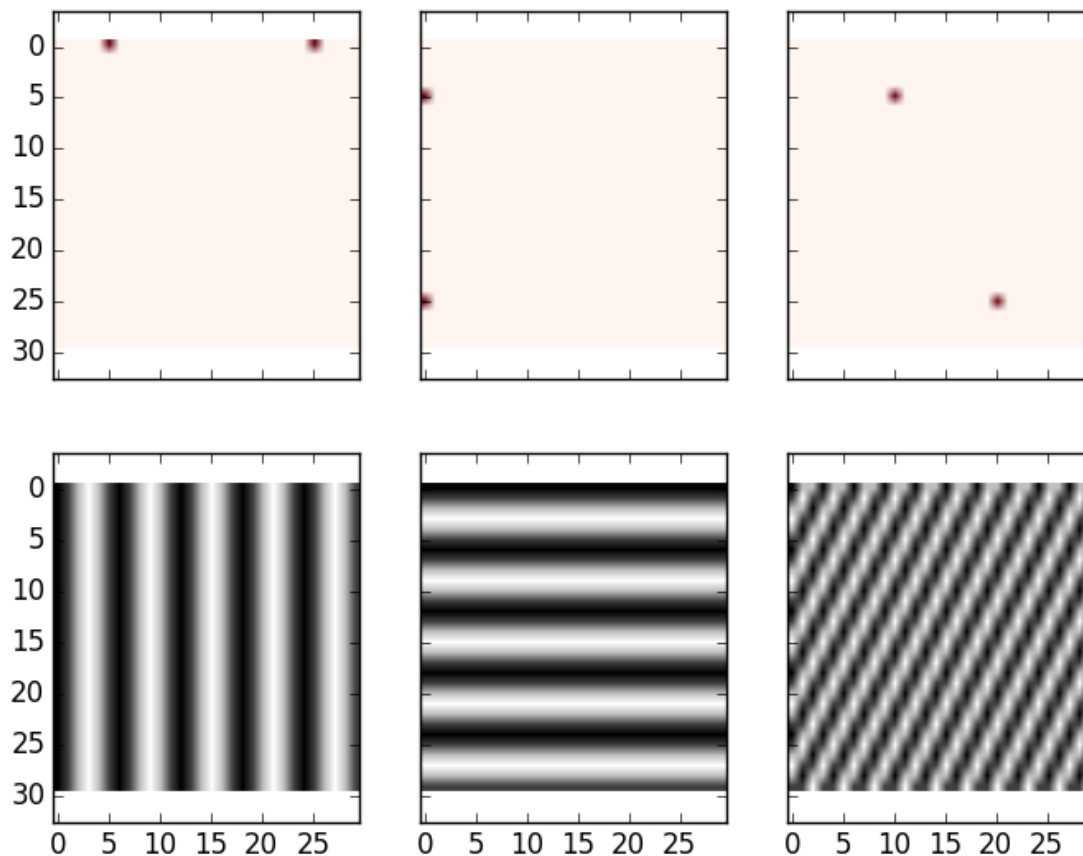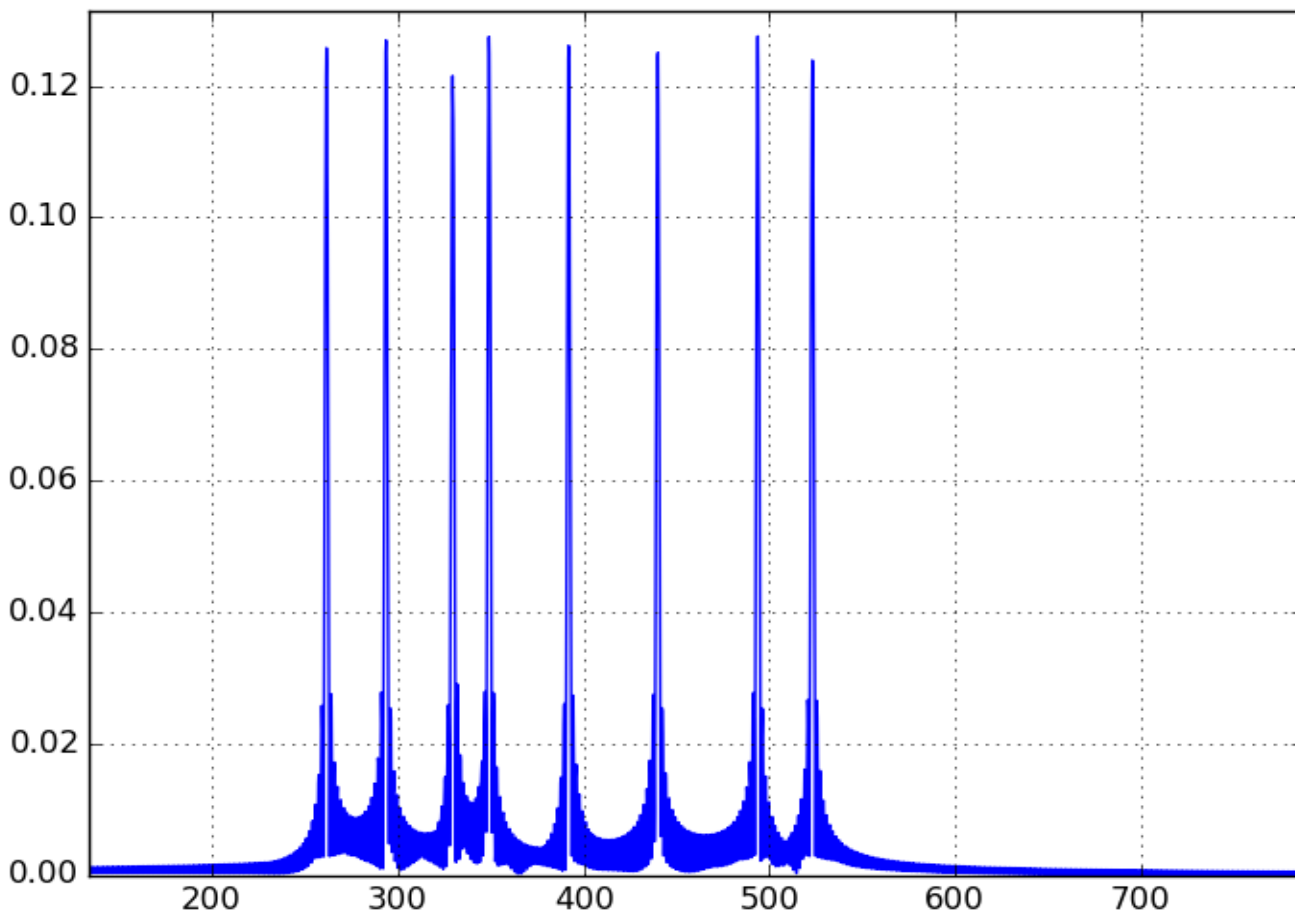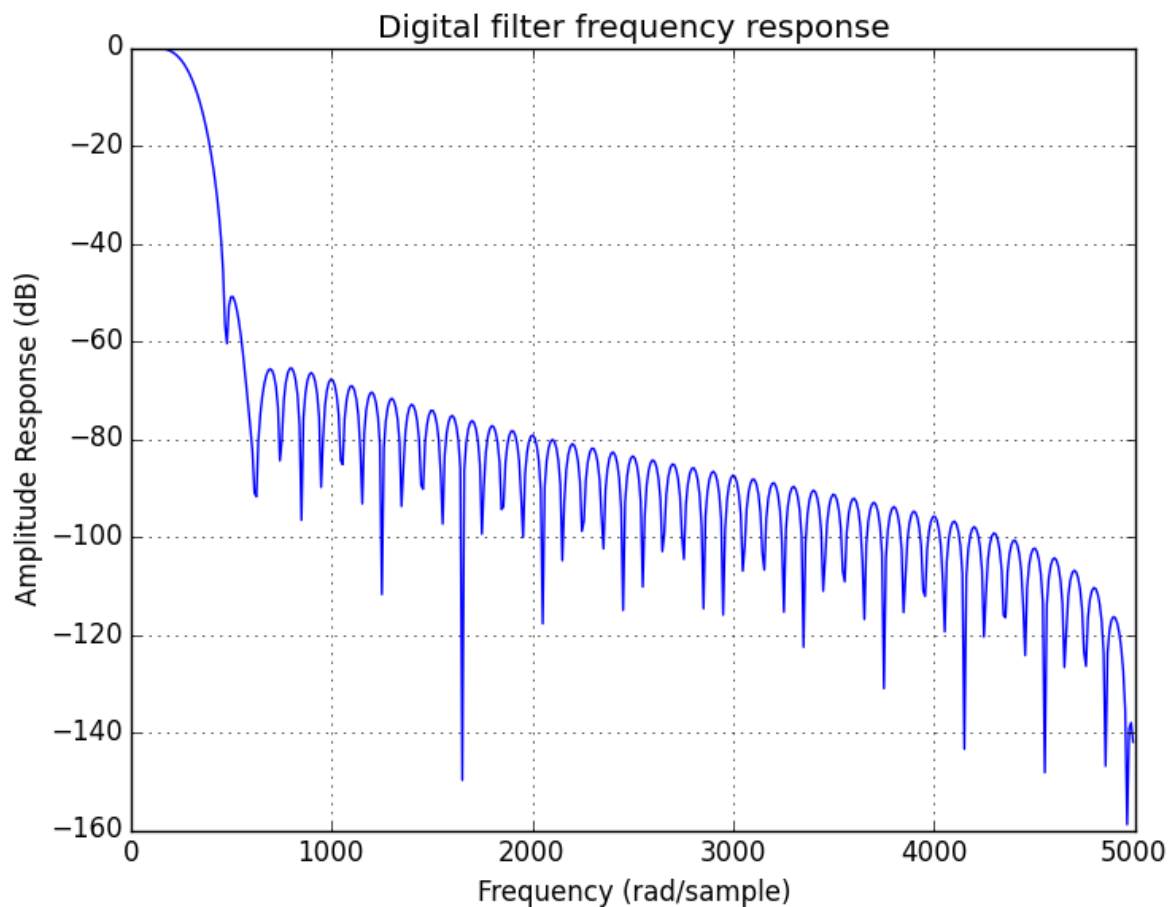
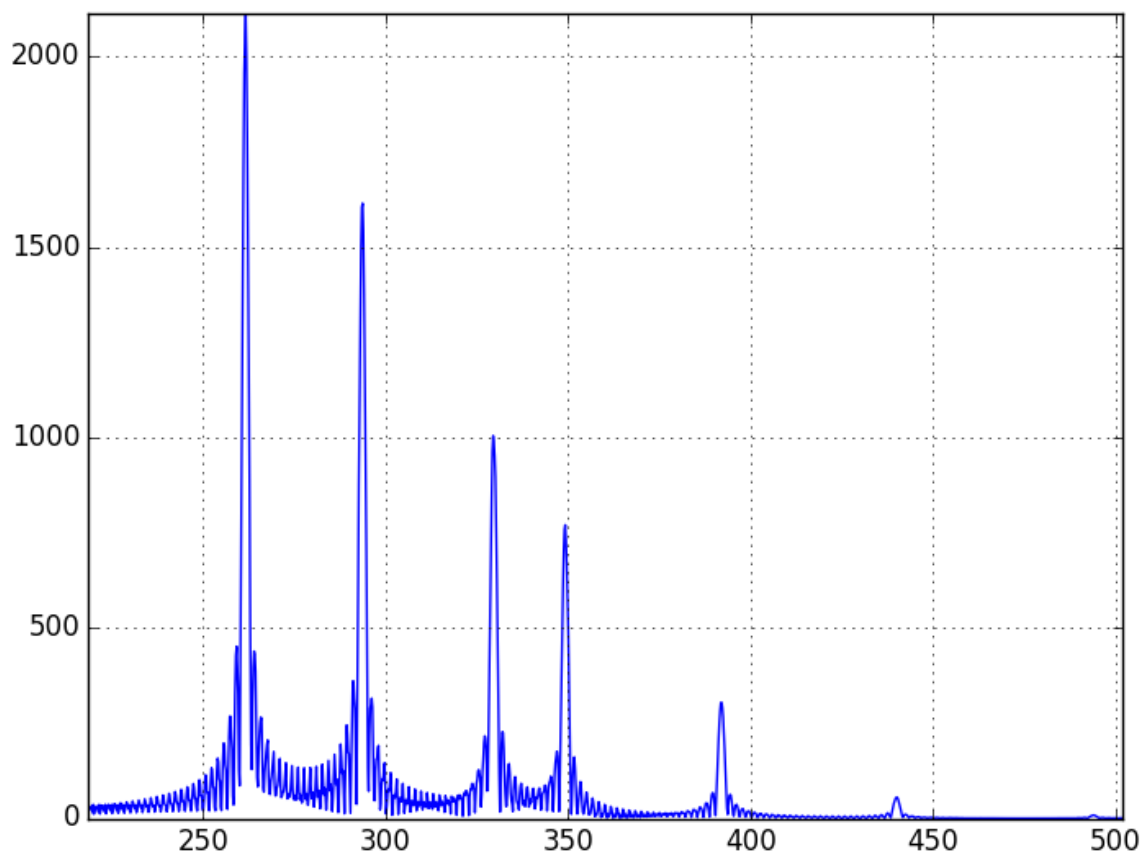# Simple FFT

Blackman Window FFT

2D-FFT

Filter Sound: Original
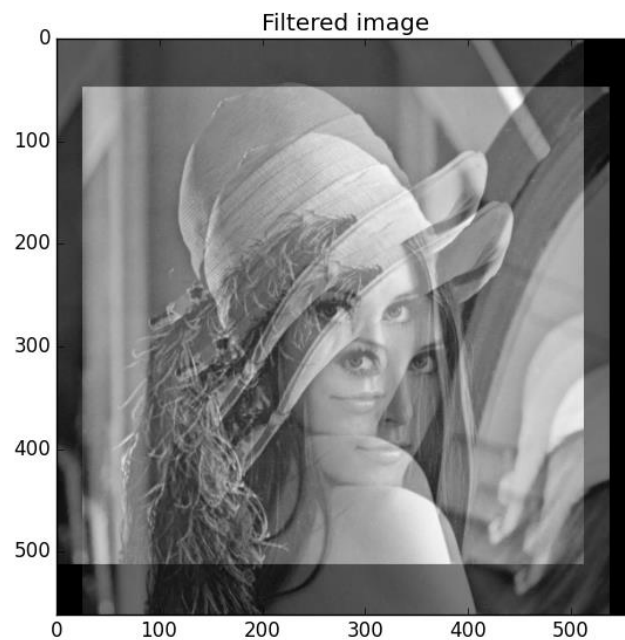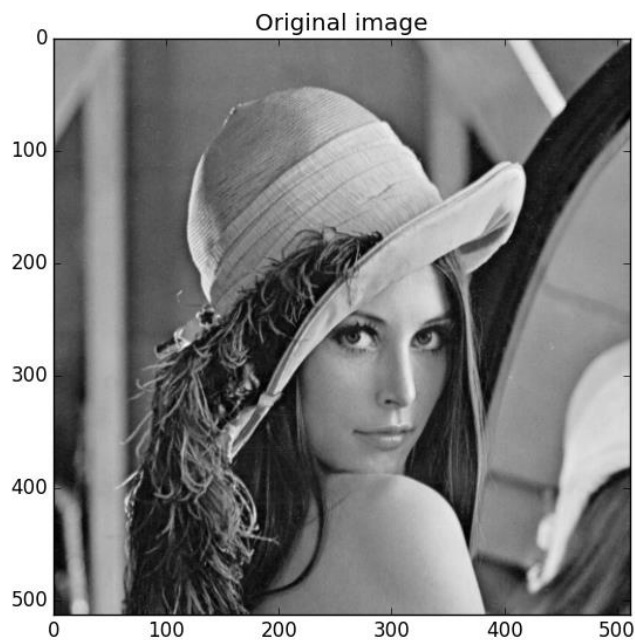
Filter Sound: Filter
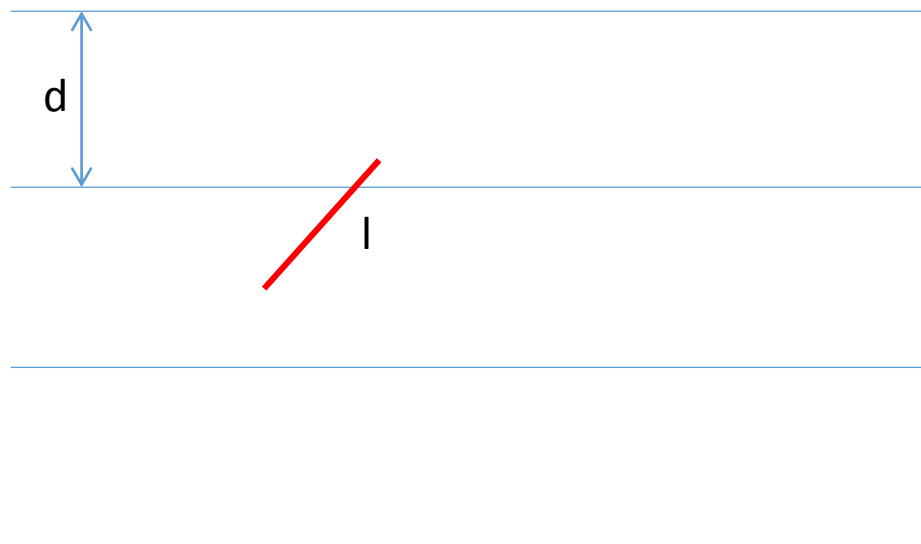
Filter Sound: Filtered Sound

Filter Image

Compute Pi: Buffon's needle

$$P(cross\ a\ line) = \frac{2l}{d\pi}$$

Buffon [1707-1788]
French Mathematician

An early variant of the Monte Carlo method!

Compute Pi: Buffon's needle

In the program, you can set:

d=2

l=1

We can do random experiments 20000 times, here is what I get:

#Cross = 6349

Est. of Pi

      = 20000/#Cross

      = 3.15