Open Source: Tools for Physics

Seminar 1

Introduction to GNU/Linux and the Command Line

About Me

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…and GNU/Linux enthusiast!

Why?

Major Premise

Physicists have to do **every day** numeric manipulations. (Data analysis, simulations, …)

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Minor Premise

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Conclusion

A physicist who knows them has much more time to focus on physics, therefore he will be (probably) a better physicist

Calendar

- 2 May, 6 PM: GNU/Linux and Command Line
- 9 May, 6 PM: Scripting and Git
- 16 May, 6 PM: Python
- 22 May, 4 PM: LaTeX and Emacs

with 45 + 45 minutes format

Modality
Workshop-like seminars

Task

Develop from scratch a simulation for a physical phenomena of great interest, analyze results and publish a report.

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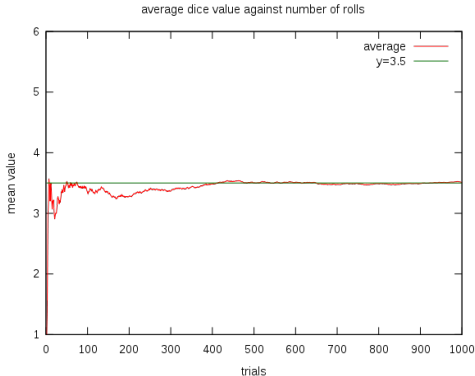In the meantime discover many interesting open source tools. You can bring your own laptop and follow what I do

Dice!

We will verify the law of large numbers and the central limit theorem
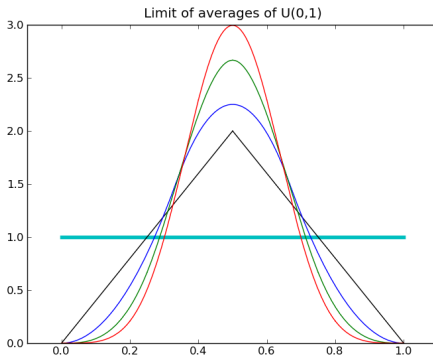
The law of large numbers

In layman's terms

average dice value against number of rolls

If $N \to +\infty$ the mean value reaches the expected value

The central limit theorem

In layman's terms

Limit of averages of U(0,1)

If $N \to +\infty$ (almost) everything ends in a Gaussian

GNU/Linux
A very brief history - I

1971 - UNIX (Dennis Ritchie)
(Proprietary Operative System)

GNU/Linux
A very brief history - II

1985 - GNU (Richard Stallman)
(Based on the UNIX philosophy)

GNU/Linux
A very brief history - III

1991 - Linux (Linus Torvalds)
(The missing piece – a kernel)

The GNU/Linux Philosophy

Axiom zero

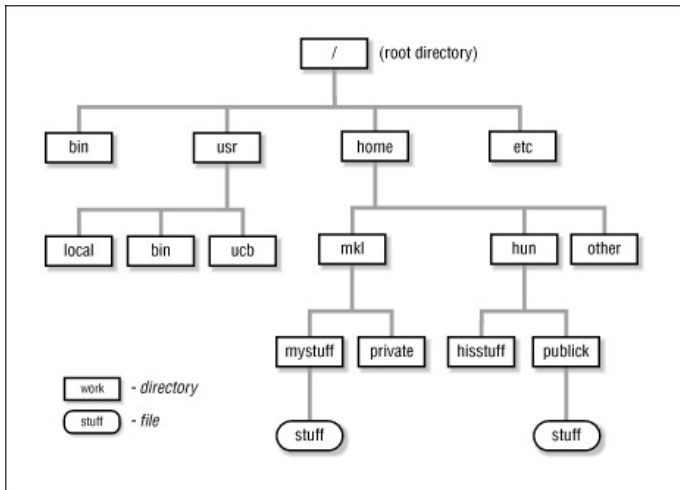GNU/Linux should be Free and Open (FLOSS) (Reproducible Research)

Axiom one

GNU/Linux should have small extensible inter-operating programs

Axiom two

In GNU/Linux plain text should play a central role

The (Pseudo)-File System

Firsts applications of the axioms
Command Line (or Terminal, or Shell)

To the terminal!