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Praktikum zu Moderne Methoden der Datenanalyse

Introduction - getting started

- The web page http://www-ekp.physik.uni-karlsruhe.de/~tkuhr/Praktikum/ contains information, material and links for this course. It will be gradually updated during the course. You might want to set a bookmark to this page in your browser.
- You need an account for this course. If you don't have one, please register for a new account by filling in the questionnaire at https://comp.physik.uni-karlsruhe.de/Account/Benutzerantrag.html. On this page you can also find a link for the prolongation of an existing account.
- It is assumed that you followed the course *Rechnernutzung in der Physik* and are familiar with the basics of Linux, xemacs (or any other editor), root and C++. Some links are provided on the web page to refresh this knowledge.
- It is recommended to create a subdirectory (with `mkdir`) in your home directory and use it as a working directory for this course.
- Root is started by typing the command `root` at the shell prompt. To quit root type `.q` (note the dot!) at the root prompt. A macro, e.g. with file name `macro.C`, can be executed in root by `.x macro.C`. To load this macro type `.L macro.C`. After the macro is loaded, functions defined in this macro can be called by simply typing the function name (with parentheses and arguments). Add a `+` after the file name, if you want to compile the macro, e.g. `.x macro.C+` or `.L macro.C+`.
- Feel free to ask questions and discuss problems and solutions with the tutors and other students. Tutors are available every Thursday from 15:30 to 17:00.

Exercise 0: Root

The aim of these exercises is to refresh the knowledge about root.

- **Exercise 0.1:**

  Write a hello world macro, i.e. a macro that prints "Hello World" on the screen.

- **Exercise 0.2:**

  Write a macro that takes two real numbers as arguments, prints whether the first or the second one is larger, and returns the absolute difference of the two numbers.

- **Exercise 0.3:**

  Write a macro that creates a histogram, fills it with N Gaussian distributed random numbers (`gRandom->Gaus()`) with mean=0 and sigma=1 and draws the histogram. N should be an argument of the macro.

- **Exercise 0.4:**

  Change the macro from exercise 0.3 so that the histogram is written to a file.

- **Exercise 0.5:**

  Write a macro that reads the histogram from the file created in exercise 0.4 and displays it.

- **Exercise 0.6:**

  Add a fit of a Gaussian function to the read histogram from exercise 0.5.

- **Exercise 0.7:**

  Make the plot nicer. Use filled blue boxes with error bars for the histogram and a red line with thickness 3 for the fitted function. Label the axes "x" and "Entries". Display only mean, rms, fit probability and fitted parameters with errors in the statistics box.

- **Exercise 0.8:**

  Create a ps file of the plot created in the previous exercise and print it.

Note: Using an ssh client, the CIP-Pool can be accessed from outside under the following address:

`fphctssh.physik.uni-karlsruhe.de`