In the name of God

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ADVANCED METHODS ON COMPUTATIONAL PHYSICS

Exercise Set 3

(Date Due: 1398/12/27)

1. Fitting formula: Using file which is called *fitinput.txt* and consider $y_{theory} = ax^H$ compute a, H and their errors.

2. Compute the PDF of Random generator of computer. Compare it with a Gaussian function.

3. Using data "*data.txt*", compute the PDF of these data sets using Top-Hat kernel for $\Delta x = 0.1$, $\Delta x = 0.01$ and $\Delta x = 0.001$ and plot them.

4. Using data "*marks.txt*", compute the PDF of these data sets using Gaussian window function for $\sigma = 2$, $\Delta x = 0.2$ and plot them.

5. Using data "*marks.txt*", compute the PDF of these data sets using Top-Hat kernel for $\Delta x = 0.1$. Then based on smoothing approach, consider $\mathcal{B}(X) = e^{-X^2/2\sigma}$ with $\sigma = 2$, $\sigma = 0.2$ in order to smooth PDF. Explain you results.

Good luck, Movahed