In the name of God

Department of Physics
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COMPUTATIONAL PHYSICS

Exercise Set 7

(Date Due: 1395/04/05)

1. Based on Variational theorem in the quantum mechanics, write a variational Monte-Carlo program to estimate the ground state of 1D harmonic oscillator.

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

3. Hamiltonian Monte Carlo method for data modelling: Using file which is called *fitinput.txt* and consider $y_{theory} = ax^H$ compute a, H and their errors using HMC method.

Good luck, Movahed