In the name of God

Department of Physics
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ADVANCED COURSE ON COMPUTATIONAL PHYSICS

Exercise Set 12

(Due Date: 1403/10/10)

1. Write a MCMC program to compute $\langle E \rangle$, $\langle |M| \rangle$, C_V and χ as a function of temperature for a 2d Ising model with

$$\mathcal{H} = -J \sum_{\langle ij \rangle} S_i S_j$$

   suppose you have 400 atoms and $k_B = J = 1$ and for $T \in [1 - 4]$ with $\Delta T = 0.1$.

2. For the above question, consider an external magnetic field as $B_{ext} = +1$, now compute $\langle E \rangle$, $\langle |M| \rangle$, C_V and χ as a function of temperature,

Good luck, Movahed