

# EXERCISES (STAT MECH II)

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## Exercise X (SS 2009):

### Problem 1:

Estimate the lowest energy of an Ising model with a cubic lattice for  $J > 0$  and zero magnetic field in 1, 2, and 3 dimensions. How is the orientation of the spins belonging to this state?

### Problem 2:

Verify that in the limit of large  $N$  the partition function of an 1 dim Ising model at zero field is given by

$$Z(T, N, 0) = [2 \cosh(J/kT)]^N \quad (1)$$

where  $J$  is the exchange constant and  $k$  is Boltzmann's constant.