Aufgabenblatt 5:

Use the given program for the simulation of the 2d ising model at $\beta = 0.4406868$ anf $h = 0$ with the Metropolis algorithm. Simulate the lattice sizes 4×4, 8×8, 16×16 and 32×32. Perform 200000 sweeps for each lattice size. Compute $< E >$, $< |m| >$ and $< m^2 >$. Determinte the statistical error and the integrated autocorrelation times.

Compare the result for the 4×4 lattice with the result of exercise 4.

Remember:

$$H = -\sum_{<xy>} s_x s_y \tag{1}$$

(Hier haben wir $J = 1$ gesetzt.)

Energy density

$$E = -\frac{1}{V} \sum_{<xy>} s_x s_y \tag{2}$$

Magnetisation

$$m = \frac{1}{V} \sum_x s_x \tag{3}$$