Exercise 6:

Write a program that simulates the 3D Ising model using the Metropolis algorithmus. What changes compared with the 2D Program are needed?

In order to test the program compare your result with the exact results for the 3^3 lattice.

β	$-V < E >$	$< M^2 >$	$< M^4 >$
0.1	9.449842	58.135338	9190.135217
0.2	30.069159	222.506788	87358.988771
0.3	67.221889	598.434354	380349.496442
0.4	77.787647	700.180042	493960.475165

Where

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

and

$$M = \sum_x s_x \tag{2}$$

Exercise 7: Use the program of exercise 6 for the simulation of 4^3, 6^3, 8^3 and 12^3 lattices. Compute the Binder Cumulant using reweighting in the neighbourhood of β_c. How should one proceed?