Tutorial 1 Tasks:

1. Execute the command '`python ising_mc.py`' for Monte Carlo simulation of the Ising model and have fun with the animations. Try adjusting the input parameters `T_list, L, J, n_eqSweeps, n_bins and n_sweepsPerBin`.

2. Set `animate=False` (to make the code run faster) and run the same code to generate data for `L=4` and `L=8` with these parameters: `T_list = np.linspace(5.0,0.5,19), n_eq=1000, n_bins=500, n_sweepsPerBin = 50`.

3. Execute the command '`python plot_ising.py`'. Fill in lines 35-39 to calculate specific heat per spin and susceptibility per spin, and then plot them.

4. Explore the `gaugeTheory_mc.py` code: fill in the code in lines 61-64 to calculate the plaquette product on plaquette `i`, and fill in lines 73-76 to calculate `deltaE` for a single spin flip. Run '`python gaugeTheory_mc.py`' with these parameters: `T_list = np.linspace(5.0,0.5,19), L=4, n_eq=1000, n_bins=500, n_sweepsPerBin = 50`. Then run '`python plot_gaugeTheory.py`' to compare your results for <E>/N vs. T with the solution for L=4 (which was also generated using Monte Carlo simulation).