

# PHYS242 Individual Report

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In our final project, I'm in charge of running the simulation (Chen Lai and Yiwen Shi wrote the codes for the simulation in both C and CUDA) and generate the results in MATLAB. I wrote all the codes for generating the plots and animation as well as calculating the numerical estimate of critical temperature in MATLAB. The main difficulty I encountered in producing the result is that the result for lattice size 5 and 10, the plots have a lot of fluctuations even if the warm up steps is  $10^5$ , and same steps for measurement. During the final presentation, the professor suggested that we should run the simulation longer for smaller lattice sizes. So I increase the warm up steps to  $10^7$ , the result is better than before but the curve is still not smooth. I really learnt a lot about Ising model and Monte Carlo method from this project.