Exercise 4 – Supervised Learning & Bayesian inference

Deadline: June 14/2019. **Send email with object: Exercise 4**

A presentation of the project in .pdf (no more than 4 pages). The files name should be surname_name_ex4.pdf. DO NOT SEND THE CODE.

If the project has been developed by a group (max 3 persons), please indicate the name of the other authors in the presentation of the project.

Tasks:

1. Classify the states of the 2D Ising model according to their phases using supervised neural networks.

You can find data and notebook "Identifying Phases in the 2D Ising Model with TensorFlow" (https://physics.bu.edu/~pankajm/MLnotebooks.html) (notebook 12) that you have already used during the Computational Lab.

Alternative, you can use a Random Forest decision tree algorithm instead of the supervised neural network (Notebook 9: Using Random Forests to classify phases in the Ising Model¶ of the same website)

2. Summarize the results and performance of the algorithm.

3. *Optional.* How you would set up (in theory) the same classification problem using a Bayesian approach? See last slides of lecture 2 of Byers. You do not need to do it practice – but of course you can if you want☺