1. Other than your fellow group members, with whom did you discuss the homework? What was the content of the discussion?

In this project, we wanted to gain a better perspective on the Ising Model. Therefore, we discussed the topic with one of the professors in the ITU Physics Engineering, Prof.Dr. Ferid Salehli. In brief, the content of our discussion evolved around the basic principles of the Ising Model, how the theory is implemented as a statistical problem and gave us an insight about the possible results of the outcome of our code.

2. Which sources did you use? What was the information/topic that you didn't know/understand and wanted to clarify with this source? Answer this question for all sources that you have used.

We used Prof. Pankaj Mehta's page to understand our data. To comprehend the basics of Ising Model and visualization we did some research then searched for Ising Model for Ferromagnetism and enhanced our knowledge. Some of the youtube videos helped us to understand the Ising Model and Monte Carlo simulations through the model and visualization of model. Our understanding of this topic was further enriched by consulting a key study from IEEE Xplore and examining a significant publication in Nature Physics.

While writing our codes, Metropolis Algorithm helped us to cover the idea of Ising Model. Previous works and ML applications helped us to form our code in its final form.

3. How long did it take for you to complete this homework?

The project took us 50 hours to complete. We spent a couple of hours reviewing all of the dataset. After deciding on the 2D Ising Dataset, we tried to understand the data and did background research about the Ising Model and its implementations. This part took us 10+

hours. We spent the rest of the hours to complete our code and analyze the results and write the final paper.

4. Which part(s) did you find most complicated?

Although we spent a significant amount of time coding, the most complicated part was understanding the data and finding a question to train the data. The data itself may not seem too complex since it is only ones and zeros but the idea behind Ising model and all of these ones and zeros made it hard to comprehend for us. After studying the fundamentals of the model and exploring the data in various ways, we could picture a question to solve and furtherly train.