Module 3 Lab Exercise – Journal – Elijah Ghaya

On this exercise, I first uploaded the Module_03_Lab_Exercise.ipynb file into Google Colab. I carefully went through all 25 cells, making sure to execute them in order while trying to understand how each step connected to the larger machine learning workflow. Unlike the last assignment which focused mostly on no visualization, this one was much more about seeing the full cycle of a model from start to finish.

In the first section, the main objective was to find all the differences between the different types of machine learning. In this part I learned that Supervised Learning is essentially like training with an "answer key", whereas Unsupervised Learning is about finding hidden patterns without labels. Seeing the code examples helped the concept click, especially when comparing it to Reinforcement Learning, which is much more trial and error orientated.

In the middle sections, the objective was to apply the Machine Learning workflow steps to the Wine dataset. This part was crucial because it showed me that Machine Learning isn't just one line of code. It involves data preparation, splitting, and especially training. I realized that if I don't split the data, the model might just "memorize" the answers rather than actually learning the patterns, which would make it useless for predictions on new data.

In the final parts, the focus shifted to evaluating the models. We compared a Logistic Regression model to a Decision Tree model. The Logistic Regression model performed better than the Decision Tree with an accuracy of 88.9%. This section was also where we encountered the Confusion Matrix, which became a great tool for finding out where the model encountered issues between the different wine classes.

Overall, this assignment was a great learning experience and was more complex than the previous lab. I feel as if I now have a fuller understanding of Machine Learning and all the vital steps that must be taken for it to be successful. I am looking forward to applying the same ML workflow steps into a new dataset later on.