### **The Challenges:**

The challenges I faced were trying to understand each step and how each step was important to follow in order to fully grasp the lab. Also, getting used to Google Colab and understanding how it works was a bit tricky at first, but I eventually understood it by trying to find errors in the code and fixing them. For example, when I was learning how to load the MNIST dataset, I wanted to see the images pop up and try it on my own. I understood it step by step. I also struggled with defining and training the neural network, especially understanding the model training logs, but I managed to figure out how it worked. Lastly, I was unsure about how the final step of the lab worked — running inference on a test image using the TFLite interpreter. But, I eventually understood how it predicted the number, how the code worked, and how to compare the predicted label with the actual label.

### **What I Learned:**

I learned how TensorFlow Lite works and how to set up the environment for real-world AI deployments. I now understand how to load the MNIST dataset, and once I upload it, a 3x3 grid is created showing handwritten digits in each part. I also learned how to define and train a neural network, and how the training logs show the model's progress, including accuracy. Using Keras, I saw how the code works and how to track the model's performance. Finally, I learned how to perform inference with TensorFlow Lite. When running the code, it performs inference on a test image, and the TFLite interpreter shows a predicted label, which is then compared with the actual label. I especially like how the predicted number is shown in the output.

### **How TensorFlow Lite Applies to Real-World AI Deployments:**

TensorFlow Lite enables machine learning models to be executed on resource-constrained devices such as smartphones or embedded systems, with low latency. This is especially useful in real-world AI deployments because it allows models to run on devices without needing a server for processing. TensorFlow Lite can perform various types of machine learning directly on the device, making it more efficient and responsive.