ITAI 3377

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**Reflective Journal**

This journal reflects on our process of creating, training, and deploying a machine learning model, specifically using TensorFlow Lite. Throughout the coding process, we learned the necessary steps to train a neural network, convert the model to TensorFlow Lite format, and run inference on smaller devices. This journey provided insights into machine learning workflows and the challenges that come with deploying models on edge devices.  
  
**Challenges Encountered**

Making sure to follow the canvas steps adequately and organizing the code for the formatting in google collab was vital. The syntax sequencing required us to really understand each line of code. We structured them appropriately by the given steps in the cells with occasional troubleshooting. Due to us not knowing the new models and functions we were learning the process of this new model.

**Key Learnings**

First, I learned how to set up the development environment by verifying Python and TensorFlow installations on Google Collab. We also had to reorganize the code paying attention to the syntax and comments to achieve our desired output. These steps were essential for making sure the tools are ready to run machine learning code smoothly. The next step was loading and processing the MNIST dataset, which included normalizing the data and visualizing a sample of handwritten digits. This taught us the importance of preprocessing data to improve the performance of machine learning models. Normalization ensures that the input data fits the range expected by the model, while visualization aids in understanding the data better.

**Real-World Applications of TensorFlow Lite**

TensorFlow Lite has profound applications in real-world AI deployments, particularly for mobile, embedded, and edge devices. By converting models into a smaller, optimized format, TensorFlow Lite enables the deployment of sophisticated AI models on devices with limited computational power, such as smartphones or wearable devices. This has a vast range of uses, from real-time image recognition and speech processing to autonomous driving and healthcare monitoring.