### **Monitoring Your Machine Learning Model with TensorBoard**

Imagine you're training a machine learning model to recognize handwritten digits from the MNIST dataset. You want to make sure your model is learning correctly and making progress. Just like a coach monitors an athlete's performance with various metrics and visualizations, you need tools to monitor your model's training process. TensorBoard is like your coach, helping you track important aspects of your model's training journey and making sure everything is on track.

### **Understanding TensorBoard**

TensorBoard is a powerful visualization tool that helps you understand and analyze your machine learning models. Here's what TensorBoard can do for you:

1. **Track Metrics**: You can monitor how well your model is performing over time by looking at metrics such as loss and accuracy.
2. **Visualize the Model Architecture**: You can see a graphical representation of your model's layers and connections.
3. **Inspect Training Data**: You can visualize how your data is processed and how features change during training.
4. **Debug and Optimize**: By visualizing histograms and distributions of weights, biases, and other tensors, you can identify issues and optimize your model.

### **Key Terms**

1. **Scalars**: These are numerical values like loss and accuracy that change over time during training. You can track these values to see how your model improves or if there are issues.
2. **Graphs**: This shows the architecture of your model, including layers and their connections. It helps you verify that your model is built as expected.
3. **Histograms and Distributions**: These display how tensors (e.g., weights and biases) change over time. They help you understand if these values are evolving in a reasonable way.
4. **Summary Writers**: These are tools for writing data to log files that TensorBoard reads. You use them to log metrics, histograms, and other information.