**A06 Assignment – TensorFlow Playground**

**Activity**

* I explored the functionality and performance of neural networks using the TensorFlow Playground.
* This assignment involved understanding neural networks' components, experimenting with various parameters, and observing their effects on model performance.

**Result**

* ReLU and Tanh provided effective training results, though ReLU occasionally faced the "dying ReLU" problem.
* Increasing hidden layers improved capacity for complex data but risked overfitting.
* Optimal rates balanced quick convergence and stable performance, while too high or too low rates caused issues.
* High noise significantly degraded accuracy, causing fluctuations in model performance.

**Reflection**

* I learned the importance of tuning parameters like activation functions, neurons, layers, and learning rates for optimal performance.
* I realized the significant impact of data noise on model performance and the importance of robust data preprocessing.

**Challenges**

* Managing overfitting with high data noise and many neurons/layers was challenging.
* Ensuring models converged properly, especially with complex datasets like the spiral pattern, required careful tuning.

This hands-on exploration provided valuable insights into the workings of neural networks and the effects of various parameters on their performance, setting a strong foundation for future studies and applications in machine learning. Below is a picture of a sample run using TensorFlow Playground with the spiral dataset.

A screenshot of a computer

Description automatically generated

TensorFlow Playground Sample Run

A screenshot of a computer

Description automatically generated

Comparison of the Different Activation Functions