**L07 Assignment – Improve the Performance of the “Chihuahua vs. Muffin” with CNNs**

**Activity**

* The goal of this assignment is to improve the performance of the "Chihuahua vs. Muffin" CNN model by modifying its parameters and architecture.
* I worked on the existing project notebook from assignment L06.
* I modified various parameters including the number of layers, learning rates, and epoch counts.
* I conducted multiple tests to observe the effects of these changes on model performance.
* I recorded the results of each test to compare accuracy and error rates.

**Result**

* Improved Accuracy: I achieved over 90% accuracy in some configurations.
* Reduced Errors: I reduced errors to less than 40%.
* Increasing the epoch count generally improved training accuracy but sometimes decreased validation accuracy.
* Adjusting the learning rate had mixed results; optimal rates were found to be around 0.8.
* Adding or reducing hidden layers affected model performance, with some configurations leading to better accuracy and lower errors.

**Reflection**

* CNNs are more efficient than traditional neural networks for image and spatial data tasks due to local receptive fields and shared weights.
* Higher learning rates are not always beneficial and can overshoot the optimal solution.
* Increasing epochs can improve accuracy but may lead to overfitting if not balanced properly.
* I started understanding mixed results and why certain configurations did not perform as expected.
* **Key Takeaways**: One of the important takeaways was grasping the underlying reasons for changes in the number of features between layers research.

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**Results of CNN Modeling on “Chihuahua vs Muffin” Data**