Neural Network Task 2
SC_3

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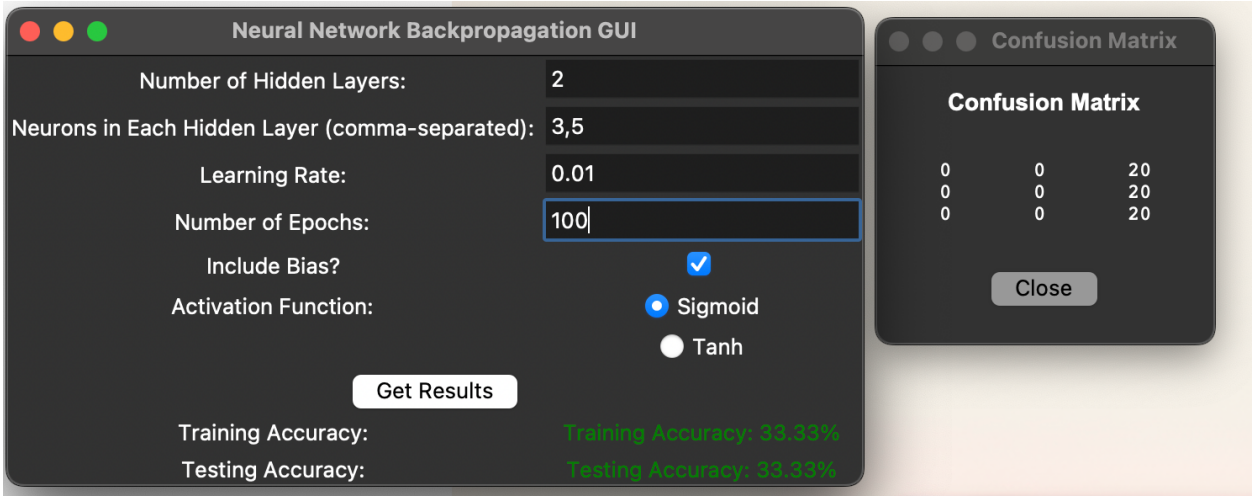
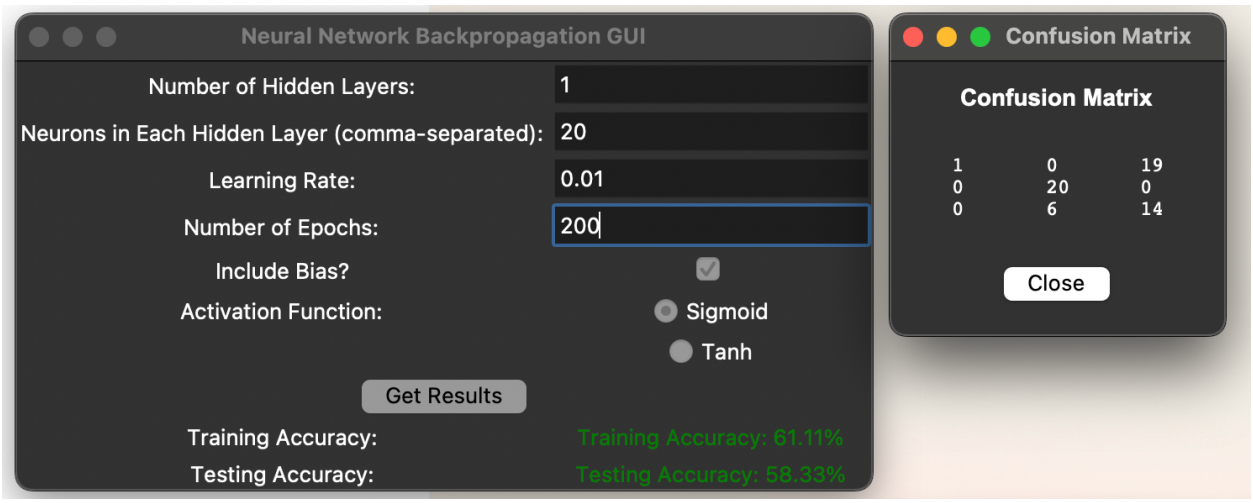
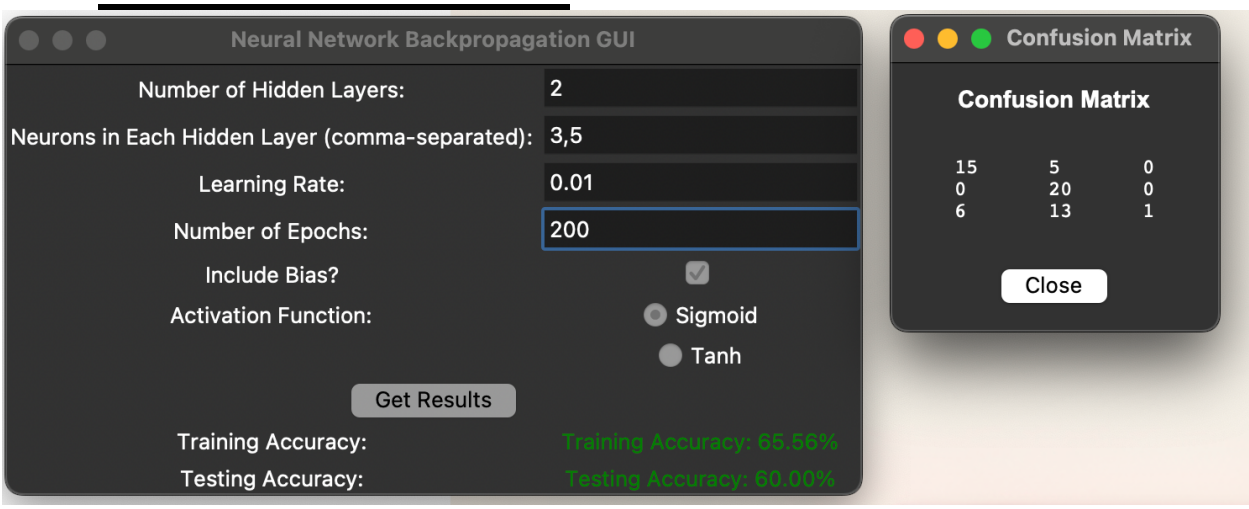
Sigmoid Function

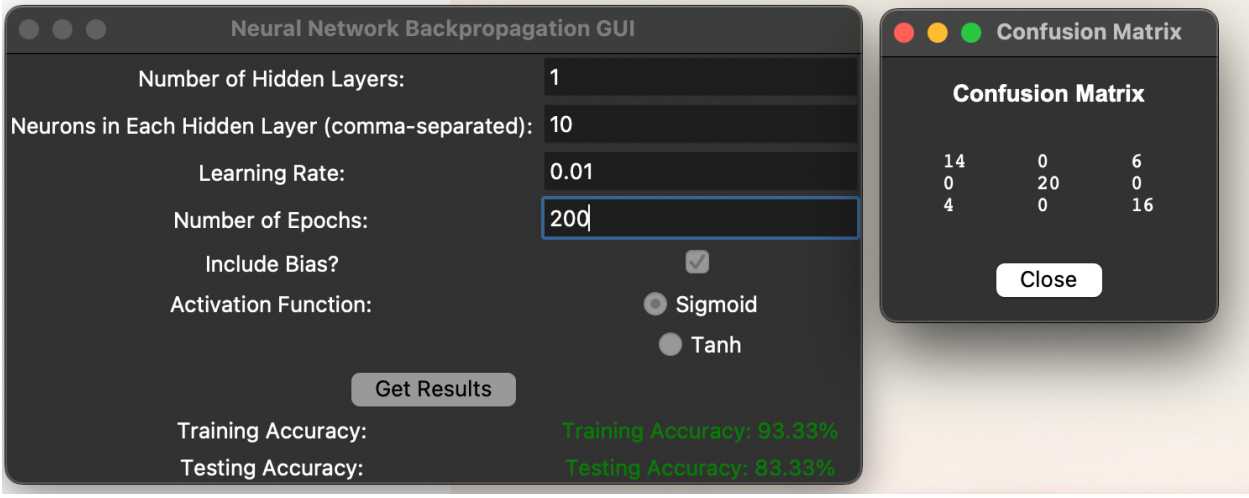
- **Init Random weights:**

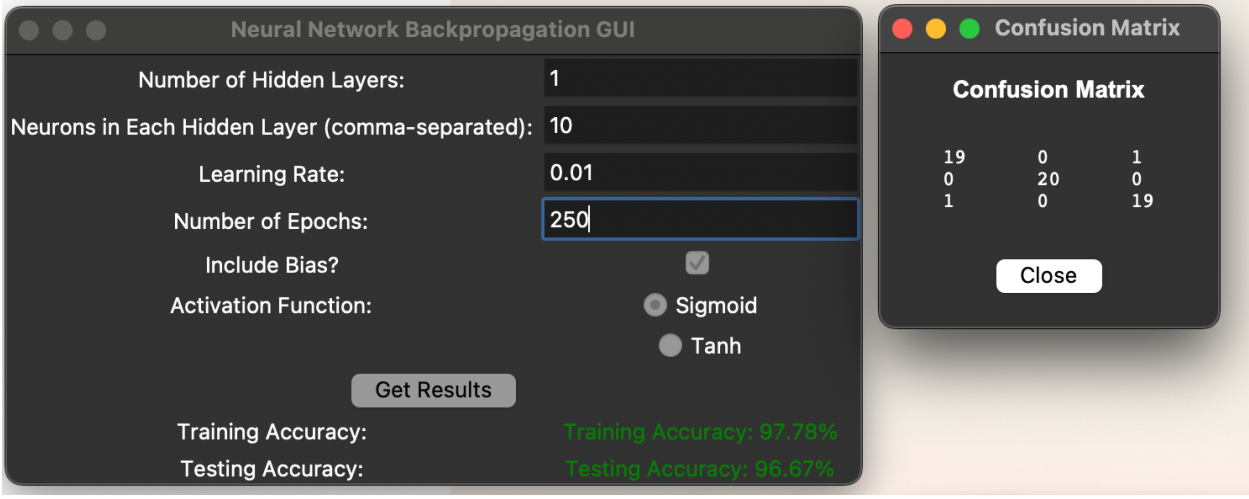




- **Xavier initialization:**







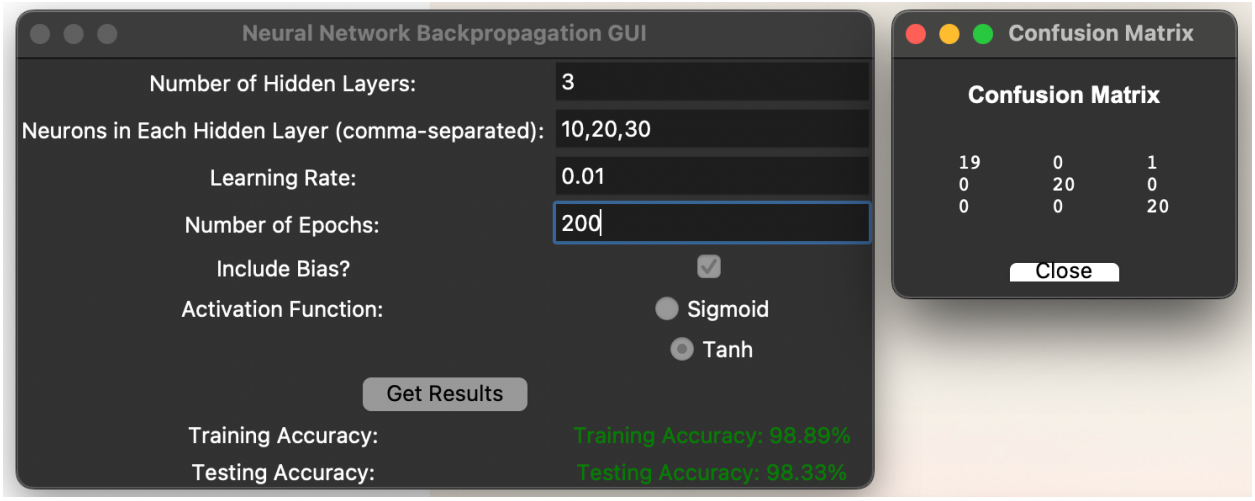
Conclusion:

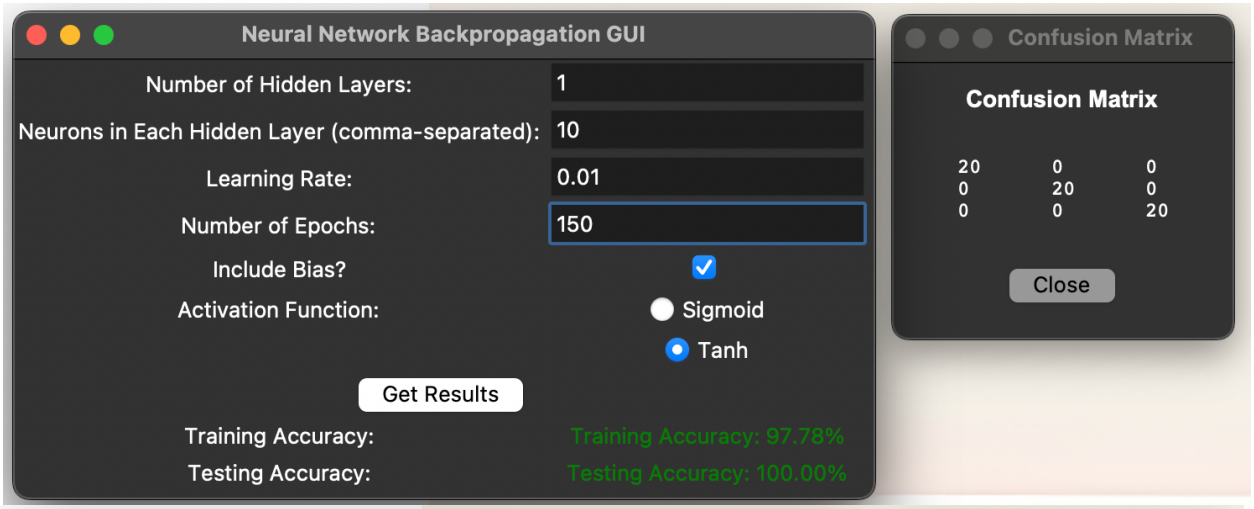
- Using random initialization of weights with the sigmoid activation function can lead to the vanishing gradient problem, particularly with multiple layers. While good results can still be achieved by increasing the number of epochs, this approach is not ideal due to the extended training time.

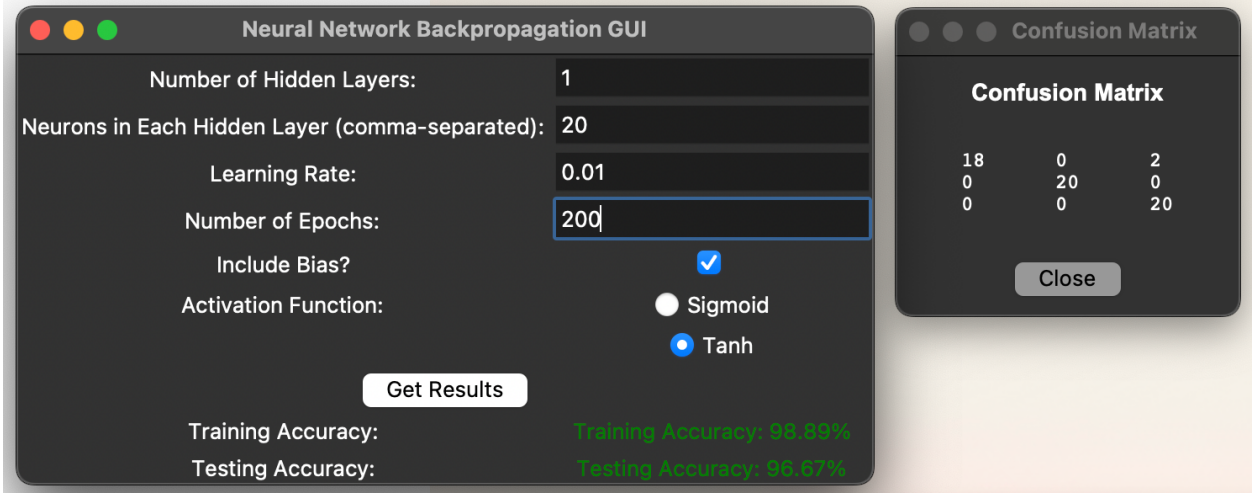
- On the other hand, Xavier initialization performs well regardless of the number of layers, neurons, or epochs. It effectively mitigates the vanishing gradient problem, enabling better results without the need for excessively long training periods.

Tanh

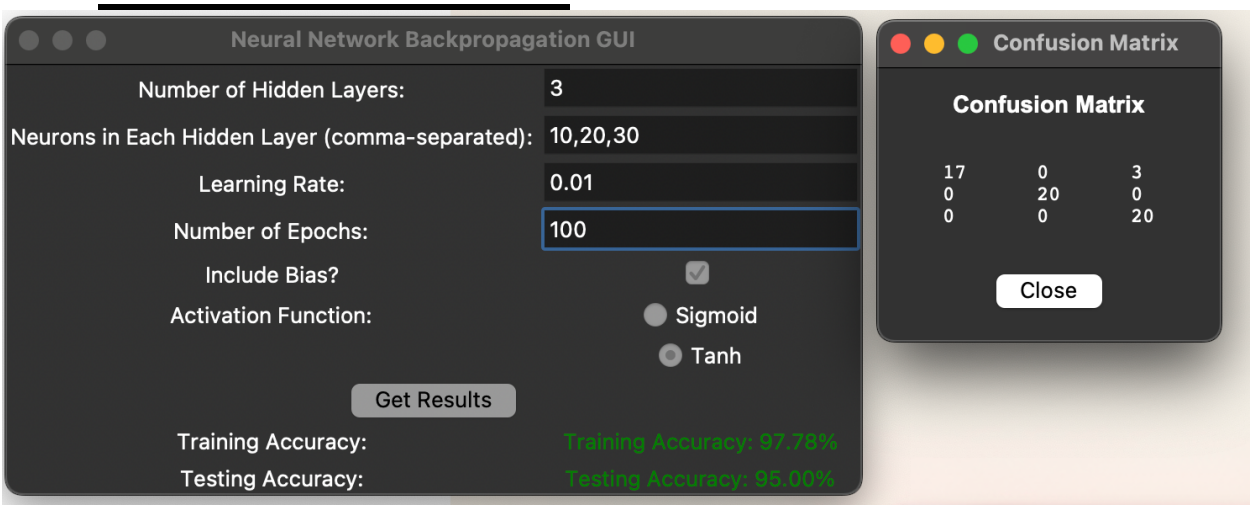
- **Init Random weights:**

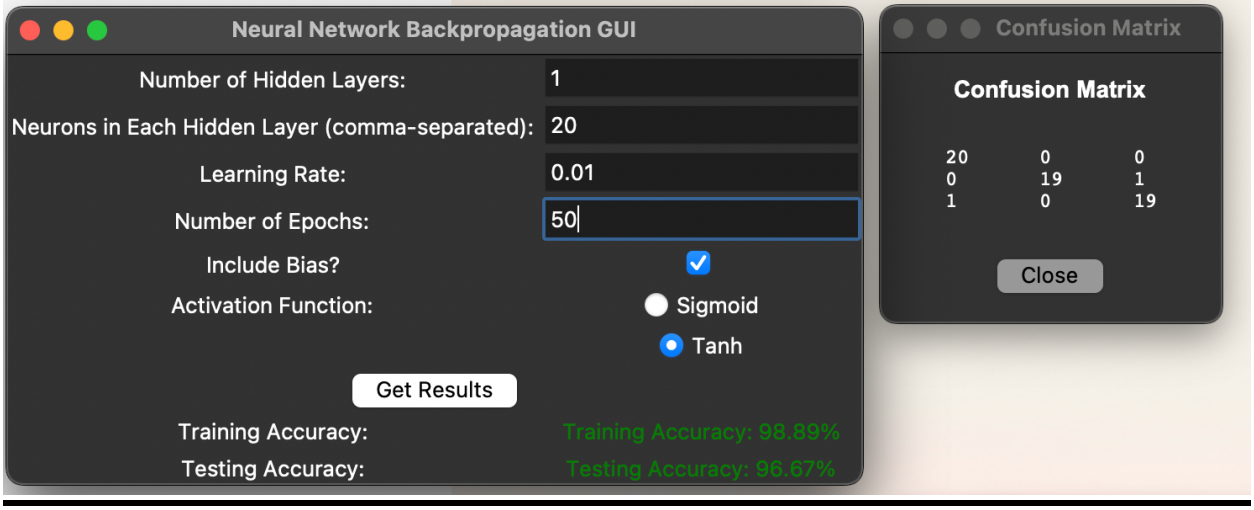






- **Xavier initialization:**





Conclusion:

For the tanh activation function, the accuracy does not significantly differ with different weight initialization methods. However, using Xavier initialization can still lead to higher accuracy with fewer epochs compared to random initialization, making the training process more efficient.