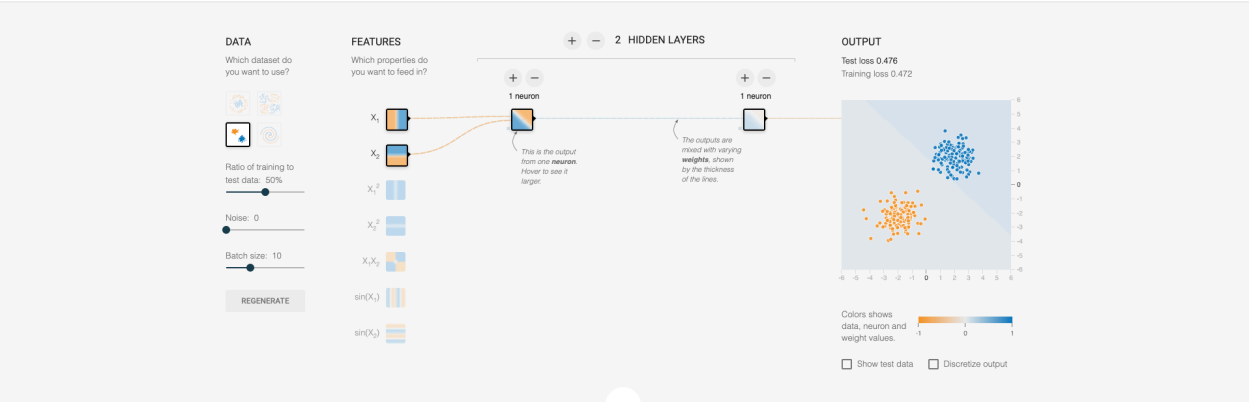
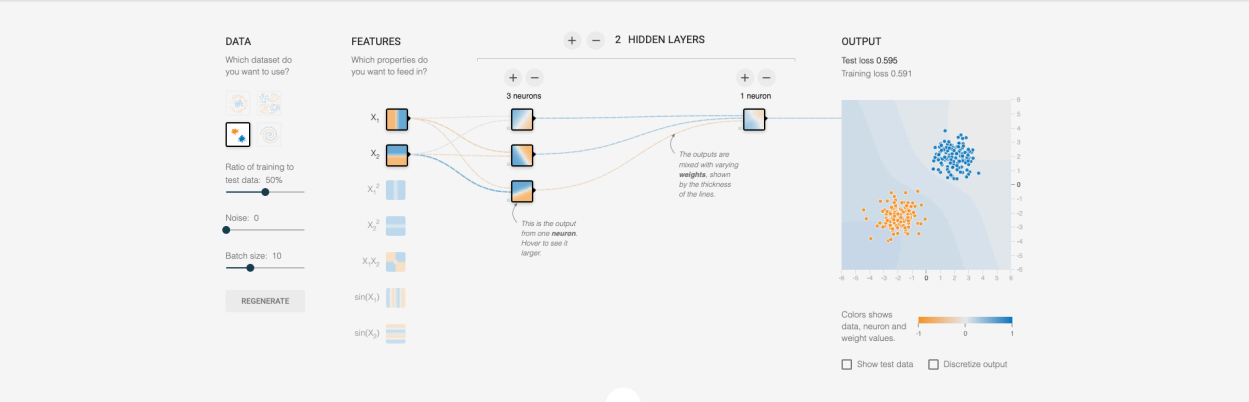
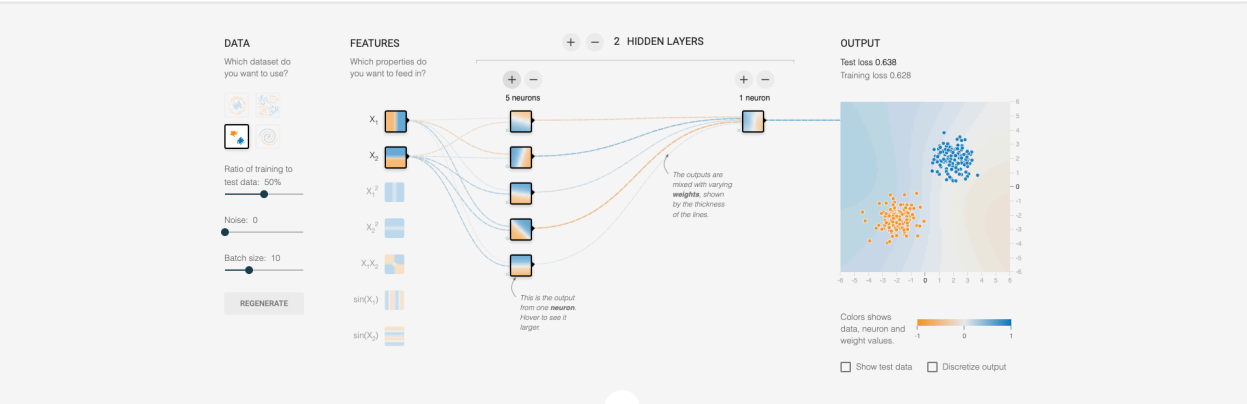
Jeffery Dirden
Professor Esmalifalak
ITAI 1370
November 1, 2024

Assignment A07

The dataset that I decided to go with while tinkering with my neural network was gaussian because I like the structure and visual for it. For the features I decided to use the x1 and x2 feature. I added 2 hidden layers and added different neurons in the first one and compared the test loss and training loss.







As you can see I changed the neuron amount in one of the network's, my objective was to correlate the test loss and training loss, and any other data that may change by adding these different components. From my understanding and testing you have to be careful to ensure a good network connection. Increasing the number of layers, and neurons can both improve, and make a model fail depending how everything is arranged. In my case as depicted in the screen shots the more neurons that I added in each test (I did 4 tests for example). The test loss and training loss increased each time every test in sequence.

Features that seem to have the greatest effect on the test loss value is of course the number of layers and neurons. The batch size and the noise feature also caused things to change dramatically. The learning rate is also affect the training process. If the learning rate is to high it may not converge properly, if its to low it may slow down training. The dropout rate, batch normalization, regularization, and activation function play critical roles on the test loss value.

CITED SOURCES

IBM, I. (2024b, October 25). Neural network. *IBM*. https://www.ibm.com/topics/neural-networks

Carter, D. S. a. S. (n.d.). *Tensorflow — Neural Network Playground*. https://playground.tensorflow.org/#activation=tanh&batchSize=10&dataset=gauss®Dataset=reg-plane&learningRate=10®ularizationRate=0&noise=0&networkShape=1,1&seed=0.67530&showTestData=false&discretize=false&percTrainData=50&x=true&y=true&xTimesY=false&xSquared=false&ySquared=false&cosX=false&sinX=false&cosY=false&sinY=false&collectStats=false&problem=classification&initZero=false&hideText=false