Mia Rodgers: https://github.com/miamrodgers/4310-ML/blob/main/ME7_NN/NN_basic.ipynb
Alex Larsen: https://github.com/alarsen123/ML-HW/blob/main/ME7_NN/ME7_NN/NN_basic.ipynb
ME7

For this exercise, we created neural network models with two hidden layers with varying numbers of units, as well as different alpha values and different activation functions. We compared model performance between the unnormalized and normalized data for both the breast cancer data set and fruit data set.

---------- Breast cancer data ----------

For the non-normalized breast cancer data (best model(s): 50, 100 units):

		malignant	benign
precision	---	0.87	0.93
recall	---	0.89	0.92
F1 score	---	0.88	0.93

accuracy: 0.91

For the normalized breast cancer data (best model(s): 10, 100 units):

		malignant	benign
precision	---	0.89	0.93
recall	---	0.89	0.93
F1 score	---	0.89	0.93

accuracy: 0.92

Best alpha: 0.1 – 47% accuracy
Best activation function: logistic, tanh, and relu all had accuracies of 37%

---------- Fruit data ----------

For the non-normalized fruit data (best model(s): 10 units):

		apple	mandarin	orange	lemon
precision	---	0.67	1.00	0.78	1.00
recall	---	0.50	1.00	0.88	1.00
F1 score	---	0.57	1.00	0.82	1.00

accuracy:

For the normalized fruit data (best model(s): 10/50/100 units):

		apple	mandarin	orange	lemon
precision	---	0.67	1.00	0.78	1.00
recall	---	0.50	1.00	0.88	1.00
F1 score	---	0.57	1.00	0.82	1.00

accuracy: 0.80

Best alpha: 0.1 – 87% accuracy
Best activation function: logistic and relu both had accuracies of 80%