**Homework 4**

Use R or Python (your choice) for all the models. Review examples provided on Canvas before attempting homework. Please turn in a Quarto (qmd) file or a word/pdf document generated from the qmd file or the Jupyter notebook.

Fit the following neural networks to the student retention data you worked with for the midterm

1. Neural network with one hidden layer, using sigmoid activation function, momentum stochastic gradient descent, and dropouts.
2. Neural network with three hidden layers, using relu activation function, Nesterov momentum stochastic gradient descent, dropouts, L2 regularization and random Gaussian weight initialization with 1/sqrt(n) standard deviation.
3. Neural network with two hidden layers, use gradient descent, regularization of your choice. Use keras tuner to determine the optimal number of neurons in each layer and also to determine the learning rate and the activation function to use.
4. Choose epoch and mini batch size for all three of the architectures by experimenting with different values
5. Write a paragraph about how the neural network models compare in accuracy to the models you tried for the midterm.