**Module 3: Option #1**

Lance I. Evans

Colorado State University Global

CSC580-1: Applying Machine Learning and Neural Networks - Capstone

Dr. Brian Holbert

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**Linear Regression Using TensorFlow**

The ability to predict the next output from a given set of inputs is a valuable tool in many applications, such as finance, weather forecasting, and stock market prediction. In this assignment, we will use TensorFlow to train a linear regression model to predict the next output from a set of random inputs. We will be using the libraries Numpy, TensorFlow, and Matplotlib for computations, modeling, and plotting, respectively. In order to make the random numbers predictable, we will define fixed seeds for both Numpy and TensorFlow. We will start by generating some random linear data for training our model. Then, we will plot the training data and define placeholders X and Y for feeding the training examples into the optimizer during the training process. We will also declare two trainable TensorFlow variables for the weights and bias and initialize them randomly. The hyperparameters for the model will be defined as the learning rate and the number of training epochs. Next, we will implement the hypothesis, cost function, and optimizer using Python code. After that, we will train the model inside a TensorFlow session and print out the results for the training cost, weight, and bias. Finally, we will plot the fitted line on top of the original data to visualize the accuracy of our model.